Symbol PIN Pad

Functional Specifications

symbol
The Enterprise Mobility Company™

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72E-91526-01
Revision A
November 2006

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The Enterprise Mobility Company™

Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
http://www.symbol.com

Revision History

Changes to the original manual are listed below.

Change	Date	Description
-01 Rev A	11/2006	Initial Symbol Release (Hypercom Version 2.5)

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ABOUT THIS GUIDE

Introduction

This document describes the operation of an application that will run within the Symbol PIN Pad and provide base-level (not user-customized) support for the Enhanced EFT Feature of the IBM 4680/4690 Supermarket Application. This application is also designed for use with IBM SurePOS ACE EPS in conjunction with the Symbol PIN Pad support library for ACE EPS.

✓ ***NOTE:*** Screens and windows pictured in this guide are samples and can differ from actual screens.

! ***IMPORTANT:*** Any references in this guide to Hypercom Corporation, Hypercom logo, Hypercom file names and file paths, Hypercom software and terminals reflect hardware and software manufactured by Hypercom Corporation for Symbol Technologies, Inc.

Notational Conventions

The following conventions are used in this document:

If applicable, the term “FormBuilder” in this guide refers to software.

Italics are used to highlight the following:

- Chapters and sections in this and related documents
- Drop-down list and list box names
- Check box and radio button names
- Icons on a screen.

Bold text is used to highlight the following:

- Names of windows
- Dialog box components.

bullets (•) indicate:

- Action items
- Lists of alternatives
- Lists of required steps that are not necessarily sequential

Sequential lists (e.g., those that describe step-by-step procedures) appear as numbered lists.

Special icons:

NOTE: Notes contain neutral or positive information supplementing the main text. It is often information that applies only to special cases.

IMPORTANT: Important statements draw attention to information crucial to using the product successfully. Pay special attention to Important statements.

CAUTION: Cautions advise that a negative result, such as a loss of data, may occur.

WARNING: Warnings provide information that is essential to the safety of the user, the equipment, or both. Failure to do as instructed may result in physical damage.

Related Documents

For the latest version of this and all payment solutions guides, go to: http://www.symbol.com/manuals .

Service Information

For service information, warranty information, technical assistance or problems with the equipment, contact the regional Symbol Global Customer Interaction Center in your area by visiting: www.symbol.com/contactsupport . Before calling, have the model number, serial number and several bar code symbols at hand.

Call the Global Customer Interaction Center from a phone near the scanning equipment so that the service person can try to troubleshoot the problem. If the equipment is found to be working properly and the problem is reading bar codes, the Support Center will request samples of the bar codes for analysis at our plant.
If the problem cannot be solved over the phone, it may be necessary to return the equipment for servicing. If that is necessary, the Global Customer Interaction Center will provide specific directions.

NOTE: Symbol Technologies is not responsible for any damages incurred during shipment if the approved shipping container is not used. Shipping the units improperly can possibly void the warranty. If the original shipping container was not kept, contact Symbol to have another sent.

If the Symbol product was purchased from a Symbol Business Partner, contact that Business Partner for service.

Software Environment

The application supports only the Visa-II message format option selectable within the Enhanced EFT Feature of Supermarket.
The application is written in C++ for the ARM Compiler (ARM Developer Suite version 1.2)

Hardware Environment

The application will require a Symbol PIN Pad able to attach to an IBM 46xx terminal using RS-232 serial, TCP/IP, or USB communication.

Assumptions

This document assumes that the reader has a level of familiarity with IBM 4680/4690 O/S and with IBM 4680-4690 Supermarket Application.

Dependencies

The application is dependent on the following:

- The operation of the Enhanced EFT Feature for IBM 46xx Supermarket Application
- The 46xx communications support provided by the Symbol PIN Pad application
- The Symbol PIN Pad RS-232 connection must work as required with 46xx terminals.
- Additionally, IBM EFT v 1.0.010 supports TCP/IP and USB connection to the ECR

For details concerning these dependencies see the Appendix A section at the end of this document.

TRANSACTIONS

Transaction Types

The following types of transactions are supported to the extent described for each:

Purchase	Fully supported for all tender types. (Credit/Debit/EBT/ACH)
Refund	Fully supported for all tender types. Refund transactions will operate in a manner similar to that of Purchases, with the principal difference being the use of the "Is Refund OK?" prompt (rather than "Is Amount OK?") during the Amount OK state.
Void of Purchase	The PIN Pad is not used by EPS when performing Void of Purchase transactions.
Balance Inquiry	Supported for EBT and Gift Card tender types. Balance Inquiries are initiated at the terminal by the operator. They operate similarly to purchase transactions, except that the "Is Amount OK?" prompt is not shown, since the terminal transmits an amount of $0.00 to the PIN Pad.
Void of Refund	EPS does not support Void of Refunds.

Tender Types

The following tender types will be supported by the PIN Pad application. The behavior of the tenders is wholly dependent upon the configuration defined within the parameter file.

Credit and Gift Card	These transactions will be fully supported by the PIN Pad application.
Debit	Debit transactions are fully supported by the application. The application supports options for the tender to prompt the customer to slide the card, to enter the PIN, to confirm the amount, and to allow an Account Type to be selected (Checking or Savings). The response from the host may indicate that the PIN is incorrect, at which point the application will re-prompt the user for a new PIN, and re-transmit the request.
EBT	EBT transactions will operate similarly to Debit, but with optional AFDC or Foodstamp type selection. Since Foodstamp and AFDC are entirely different tender types within the ACE/EPS Personalization, they must be configured as separate tender types within the PIN Pad.
ACH	ACH transactions will be handled in a manner similar to that of any other EFT tender that uses the PIN Pad. Check transactions will only be used with the PIN Pad for ACH (Automated Clearing House) tenders that usually require a PIN. ***NOTE:*** When configuring an ACH tender, 'Check' must be selected as the EPS Payment Type.

MESSAGES

Overview

The terminal and the PIN Pad application communicate by means of messages sent from one to the other. In almost all circumstances the terminal must initiate the communications. Although most messages require a response, some of the messages do not.
All messages begin with an STX character (0x02) and end with an ETX character (0x03) which is followed by an LRC character. The maximum message length, including the STX, ETX, and LRC characters, is 247 bytes (a limit imposed by the IBM 4690 Operating System and IBM 46xx Terminal hardware). In order to ensure successful transmission of a message, each message sent between the PIN Pad and the terminal must be either ACKed (if successful), or NAKed (if corrupt or in error), by the recipient of the message. The ACK/NAK responses are discussed in more detail in the section "PIN Pad to Terminal Communications".
For brevity and clarity, these ACK/NAK responses have been omitted from the discussion of messages (all messages discussed, unless specifically indicated as having failed, are considered to have been successfully transmitted and ACKed by the recipient).

✓ ***NOTE:*** If the PIN Pad is in the offline state, the PIN Pad will respond to all messages (except the online request) with an offline response.

Messages from Terminal to PIN Pad

ID	Message Type	Description	Possible Response
"00."	Offline Message	Indicates to the PIN Pad that the terminal has signed off, and that the PIN Pad should enter its own offline state.	No Response sent.

ID	Message Type	Description	Possible Response
“01.”	Online Request	Indicates to the PIN Pad that the terminal has signed on, and that the PIN Pad should verify the program and parameter levels against those it currently contains and stores the specified level information on. If PIN Pad does not request a new program and/or parameters automatically, it is supposed that PIN Pad contains the latest application version.	Online Response, Parameter Load Request
“03.”	Set Session Key Request	Terminal sends a new working key (encryption key) to the PIN Pad.	Set Session Key Response
“04.”	Set Payment Type Request	Forces a payment type selection at the PIN Pad rather than the customer entering it.	Set Payment Type Response
“07.”	Unit Data Request	Sent by the terminal to request Unit Data. Unit Data response contains PIN Pad software levels, available functions, and any other pertinent data concerning the PIN Pad setup and functions.	Unit Data Response
“10.”	Reset Message	Sent by the terminal to indicate that the operator has cancelled the tender, or that the current transaction has been completed (prior to a new transaction being started at the terminal).	No Response sent.
“11.”	Status Request	Sent by the terminal to determine the current state of the PIN Pad.	Status Response
“12.”	Account Message	Sent by the terminal in order to supply the account number (as an alternative to sliding the card at the PIN Pad).	No Response sent.
“13.”	Amount Message	Sent by the terminal when the operator has selected the tender type and amount, in order to supply the transaction amount to the PIN Pad.	Authorization Request, Reset Message
“14.”	Refund Message	Sent by the terminal to indicate that the transaction being performed at the terminal is a Refund.	No Response sent.
“19.”	Card Swiped Response Message	Sent by the terminal in response to Card Swiped Message	No Response sent.
“20.”	Signature Request Message	Received after Authorization Request is sent to the terminal while waiting for Authorization Response. Prompts customer for signature.	No Response sent.
“28.”	Set Variable Message	Sent by the Terminal to set one of the parameters stored in the PIN Pad.	Set Variable Message, Offline Message
“29.”	Get Variable Message	Sent by the terminal to obtain the value of one of the parameters stored in the PIN Pad.	Get Variable response, Reset Message
“0**”	Authorization Response	Sent by the terminal in response to the Authorization Request (50.) There is no ID as such, just the single '0' followed immediately by the fields of the message.	No Response sent.

ID	Message Type	Description	Possible Response
“9xx”	Parameter Load Block	Sent by the terminal in response to the Parameter Load Request (59.). The "xx" portion of the ID is incremented from 00 through 99 for each parameter block, and then rolls over to 00 again.	Parameter Load Confirmation No Response (if PIN Pad has not received the final block)
“60.”	Payment Setup Request	Sent by the terminal to add new or update existing payment type.	Payment Setup Response

Messages from PIN Pad to Terminal

ID	Message Type	Description
“00.”	Offline Message	Sent by the PIN Pad, when the PIN Pad is in an Offline state, as a response to any request for which a response is permitted. The exception is an Online Request from the terminal, which will only receive an Offline Message if the PIN Pad is unable to successfully load the requested program or parameters, or is requested to use its current level of program or parameters, yet is unable to do so.
“01.”	Online Response	Sent by the PIN Pad as a response to the Online Request when the PIN Pad has successfully changed to the Online state, with the correct levels of program and parameters.
“02.”	Program Load Request	Sent by the PIN Pad as a response to the Online Request when the Program Version Number is different from that currently running on the PIN Pad.
“03.”	Set Session Key Response	Sent by the PIN Pad in response to the Set Session Key Request.
“04.”	Set Payment Type Response	Sent by the PIN Pad in response to the Set Payment Type Request.
“07.”	Unit Data Response	Sent by the PIN Pad in response to the Unit Data Request.
“10.”	Reset Message	Sent by the PIN Pad when the user has cancelled a transaction after the Amount Message has been sent from the terminal, but before the Authorization Request has been sent by the PIN Pad.
“11.”	Status Response	Sent by the PIN Pad as a response to a Status Request.
“19.”	Card Swiped Message	Sent by the PIN Pad to indicate a card swipe has occurred.
“28.”	Set Variable Message Response	Sent by the PIN Pad as a response to a Set/Get Variable Message.
“29.”	*GET VARIABLE MESSAGE RESPONSE*	*SENT BY THE PIN PAD TO PROVIDE DATA FROM THE PIN PAD.*
“50.”	Authorization Request	Sent by the PIN Pad as a response to the Amount Message. Responses: Authorization Response Message, Amount Message, Reset Message, Offline Message
“59.”	Parameter Load Request	Sent by the PIN Pad as a response to the Online Request when the Parameter Version Number is different from that currently loaded into the PIN Pad.

ID	Message Type	Description
“59.”	Parameter Load Confirmation	Sent by the PIN Pad as a response to the last block of a parameter load block series. The PIN Pad then immediately transmits an Online Response indicating the levels of the program and parameters.
“60.”	Payment Setup Response	Sent by the PIN Pad as a response to a Payment Setup Request.

Detailed Descriptions

Offline Message (00.)

Indicates to the PIN Pad that the terminal has signed off and the PIN Pad should enter its own offline state.

Direction : **Terminal → PIN Pad**
Message Type : “00.”
Allowed : At any time
Expected Response : None

Offset	Length	Description
0	1	STX
1	3	Message ID - ASCII "00."
4	4	Reason Code - ASCII text "0000" – no errors present
8	1	ETX
9	1	LRC

Sent by the PIN Pad, when the PIN Pad is in an Offline state, as a response to any request for which a response is permitted.

Direction : **PIN Pad→ Terminal**
Message Type : “00.”
Allowed : As response to any message that expects a response (i.e. Online Request, Status Request, etc.)
Expected Response : None

Offset	Length	Description
0	1	STX
1	3	Message ID - ASCII "00."
4	4	Reason Code - ASCII text "0000" – no errors present "08xx" – PIN Pad internal error (“xx” will indicate the specific error) "10xx" – request not understood (“xx” will indicate the specific error detected within the request) "20xx" – request not valid in current state (“xx” will be the current PIN Pad state number, as it would be returned within a Status Response message). See the section Offline Reason Codes for the specific values and descriptions of these error codes.
8	1	ETX
9	1	LRC

Online Request (01.)

Indicates to the PIN Pad that the terminal has signed on, and that the PIN Pad should verify the program and parameter levels against those it currently contains (requesting new load/parameters if necessary). Values of “0000” for either the Program Load Version Number or for the Parameter Load Version Number fields signify that the PIN Pad should continue to use its current level of that component (unless the PIN Pad has no such component, in which case it will go Offline).

Direction :	**Terminal → PIN Pad**
Message Type :	“01.”
Allowed :	At any time (only expected when PIN Pad is in an Offline state, though)
Expected Response :	Online Response Parameter Load Request Offline Message

Offset	Length	Description
0	1	STX
1	3	Message ID - ASCII "01."
4	4	Program Load version number - ASCII “TXYY”, where: T = Terminal type (see Table 2 for set of all Terminal Type Codes), X = Major version, and YY = Minor version. Example: 7259 where 7 = PD8700, 2 = Major version, and 59 = Minor version
8	1	Screens Load version number - ASCII numeric (0 - 9)
9	3	Parameter Load version number - ASCII numeric (000 - 999)
12	1	ETX
13	1	LRC

Online Response (01.)

Sent by the PIN Pad as a response to the Online Request when the PIN Pad has successfully changed to the Online state, with the correct levels of program and parameters.

Direction :	**PIN Pad→ Terminal**
Message Type :	“01.”
Allowed :	As an immediate response to an Online Request, or after a Parameter Load Confirmation Message has been sent to the terminal
Expected Response :	None

Offset	Length	Description
0	1	STX
1	3	Message ID – ASCII "01."
4	4	Program load version number - ASCII "TXYY" same as specified in Online Request (01.) when program load operation is successful or current version of the program.
8	4	Parameter load version number - ASCII "0001" through "9999"
12	1	ETX
13	1	LRC

Program Load Request (02.)

Sent by the PIN Pad as a response to the Online Request when the Program Version Number is different from that currently running on the PIN Pad.

Direction : **PIN Pad → Terminal**
Message Type : "02."
Allowed : As a response to an Online Request issued by the terminal.
Expected Response : Series of Parameter Load Block Messages

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "02."
4	8	PIN Pad serial number
12	1	ASCII control character – ETX
13	1	LRC check character

Set Session Key Request (03.)

Sent by the terminal to set a new Session Encryption Key in the PIN Pad.

Direction : **Terminal → PIN Pad**
Message Type : "03."
Allowed : At any time.
Expected Response : Set Session Key Response

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "03."
4	16	Session Key
20	1	ASCII control character – ETX
21	1	LRC check character

Set Session Key Response (03.)

Sent by the PIN Pad in response to the Set Session Key Request.

Direction : **PIN Pad→ Terminal**
Message Type : "03."
Allowed : At any time
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "03."
4	16	Status Flag 0 = Success 1 = Failed
4	1	ASCII control character – ETX
5	1	LRC check character

Set Payment Type Request (04.)

Sent by the terminal to indicate the payment type selected by the cashier. The PIN Pad should bypass the tender selection menu when the tender selection is sent in the "04." message.

Direction :	**Terminal → PIN Pad**
Message Type :	"04."
Allowed :	When PIN Pad is in Card Slide or Payment Type states.
Expected Response :	Set Payment Type Response

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "04."
4	1	1 Debit 2 Credit 3 EBT 4 Food Stamps 5 Store(ACH)
5	Variable	Transaction Amount – optional. Not needed if "04." message is followed by a "13." message.
M	1	ASCII control character – ETX
M+1	1	LRC check character

Set Payment Type Response (04.)

Sent by the PIN Pad in response to the Set Payment Type Request.

Direction :	**PIN Pad→ Terminal**
Message Type :	"04."
Allowed :	At any time
Expected Response :	None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "04."
4	1	0 = Success 1 = Failed
5	Variable	Transaction Amount
M	1	ASCII control character – ETX
M+1	1	LRC check character

Unit Data Request (07.)

Sent by the terminal to request Unit Data.

Direction : **Terminal → PIN Pad**
Message Type : "07."
Allowed : At any time.
Expected Response : Unit Data Response

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "07."
4	1	ASCII control character – ETX
5	1	LRC check character

Unit Data Response (07.)

Sent by the PIN Pad in response to the Unit Data Request.

Direction : **PIN Pad→ Terminal**
Message Type : "07."
Allowed : At any time
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "07."
4	Variable	Pin Pad model string ("PD8700" for PD8700 or "PD47xx" for PD4700 and PD4750 hardware)
M	1	Field Separator – FS = 0x1C
M+1	Variable	Boot Loader Version
B	1	Field Separator – FS = 0x1C
B+1	Variable	OS Version
O	1	Field Separator – FS = 0x1C
O+1	4	Program Version
O+5	4	Parameters Version
O+9	1	Field Separator – FS = 0x1C
O+10	Variable	Pin Pad capabilities – each character in the string represents a function which may or may not exist in the PIN Pad (SigCap, Smart Card WIC, RFID, etc.). Each character is either "0" – disabled or "1" - enabled
C	1	ASCII control character – ETX
C+1	1	LRC check character

PIN Pad capabilities

The capabilities are represented as a string of character (‘0’ or ‘1’) where each capability is represented by a separate character. ‘1’ character means that given capability is present, ‘0’ – the capability is not present. Currently the capability string (which is returned in Unit Data response) is 16 characters long. Below is the list of Symbol PIN Pad capabilities:

Index	Values	Capability Description
0	ASCII ‘1’ – present, ‘0’ – NOT present	RFID Device
1	ASCII ‘1’ – present, ‘0’ – NOT present	MSR Device
2	ASCII ‘1’ – present, ‘0’ – NOT present	Smart Card Device
3	ASCII ‘1’ – present, ‘0’ – NOT present	Serial Communications Port
4	ASCII ‘1’ – present, ‘0’ – NOT present	Serial Communications Port #2
5	ASCII ‘1’ – present, ‘0’ – NOT present	USB Port
6	ASCII ‘1’ – present, ‘0’ – NOT present	USB Host
7	ASCII ‘1’ – present, ‘0’ – NOT present	Ethernet Communications Port
8	ASCII ‘1’ – present, ‘0’ – NOT present	Color Display
9	ASCII ‘1’ – present, ‘0’ – NOT present	Electronic Signature Capture capable
10	ASCII ‘1’ – present, ‘0’ – NOT present	Smart Card WIC feature
11	ASCII ‘1’ – present, ‘0’ – NOT present	JCB (Japanese dual-side Card) capable
12	ASCII ‘1’ – present, ‘0’ – NOT present	Reserved
13	ASCII ‘1’ – present, ‘0’ – NOT present	Reserved
14	ASCII ‘1’ – present, ‘0’ – NOT present	Reserved
15	ASCII ‘1’ – present, ‘0’ – NOT present	Reserved

Reset Message (from Terminal) (10.)

Sent by the terminal to indicate that the operator has cancelled the tender, or that the current transaction has been completed (prior to a new transaction being started at the terminal). PIN Pad should clear all card data and reset to initial state.

Direction :	**Terminal → PIN Pad**
Message Type :	"10."
Allowed :	At any time.
Expected Response :	None.

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "10."
4	1	ASCII control character – ETX
5	1	LRC check character

Reset Message (from PIN Pad) (10.)

Sent by the PIN Pad when the user has cancelled a transaction after the Amount Message has been received from the terminal, but before the Authorization Request has been sent by the PIN Pad.

Direction :	**PIN Pad→ Terminal**
Message Type :	"10."
Allowed :	At any time that the PIN Pad is normally permitted to send a message to the terminal (i.e. as a response to an Amount Message or a Status Request, etc.)
Expected Response :	None (in practice, the terminal commonly transmits a Reset Message back to the PIN Pad following receipt of a Reset Message from the PIN Pad)

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "10."
4	1	ASCII control character – ETX
5	1	LRC check character

Status Request Message (11.)

Sent by the Terminal to determine the current state of the PIN Pad. ACE/EPS software within the terminal will use the Status Request Message to monitor activity at the PIN Pad.

Direction : **Terminal → PIN Pad**
Message Type : "11."
Allowed : At any time.
Expected Response : Status Response Message, Offline Message, Reset Message

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "11."
4	1	ASCII control character – ETX
5	1	LRC check character

Status Response Message (11.)

Sent by the PIN Pad as a response to a Status Request.

Direction : **PIN Pad→ Terminal**
Message Type : "11."
Allowed : As a response to a Status Request Message
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "11."
4	2	Current state indicator: "01" – slide card "02" – transaction type "03" – enter PIN "04" – amount OK "05" – processing "06" – approved/declined "07" – error: reenter PIN "08" – loading – LR "09" – loading "10" – Signature Capture "11" – Please Wait "12" – payment ECR selected
6	Variable	First Unique text indicating the PIN Pad display, 0 to 32 characters
X	1	Field separator - FS (0x1C)
X+1	Variable	Additional unique text indicating the PIN Pad display, 0 to 32 characters
Y	1	ASCII control character – ETX
Y+1	1	LRC check character

Account Message (12.)

Sent by the terminal in order to supply the account number and expiry date to the PIN Pad. This may be used if the card is not able to be read by the PIN Pad, and/or if the operator chooses to slide the card at the terminal, or to manually key in the card data. The terminal will perform a test, and will only transmit this message if the PIN Pad is in the Slide Card state. If the PIN Pad receives this message, but has already successfully acquired card information from the customer by means of the MSR, the PIN Pad will change to the Offline state, and will set the Reason Code for the Offline Response to be "20xx" – request not valid in current state. The Offline Message will be transmitted to the terminal at the next opportunity the PIN Pad is given to transmit a response.

Direction : **Terminal → PIN Pad**
Message Type : "12."
Allowed : When the PIN Pad is in state 1 (Slide Card)
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "12."
4	Variable	Account number (13 to 24 digits)
N	1	Field separator "=" (0x3D)
N+1	4	Expiration date, always YYMM order
N+5	Variable	Discretionary data
M	1	ASCII control character – ETX
M+1	1	LRC check character

Amount Message (13.)

Sent by the terminal when the operator has selected the tender type and amount, in order to supply the transaction amount to the PIN Pad. A value of "000" in the Amount Due field will be used to inform the PIN Pad that it should NOT display the amount to the user, nor should it permit confirmation or changes to the amount.

Direction : **Terminal → PIN Pad**
Message Type : "13."
Allowed : At any time when the PIN Pad is in state 1 (Slide Card), through state 3 (Enter PIN), including the "Please Wait" state
Expected Response : Authorization Request Message, Reset Message, Offline Message

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "13."
4	1	CashBack Flag 0 - Disable CashBack for this tender 1 - Use default CashBack setting for this tender
5	Variable	Amount due, in cents (3 to 12 characters) ("000" has special meaning)
N	1	ASCII control character – ETX
N+1	1	LRC check character

Refund Message (14.)

Sent by the terminal to indicate that the transaction being performed at the terminal is a Refund. The refund message must always arrive before the amount message. If the refund message is received by the PIN Pad after the amount message has been received, the PIN Pad will change to the Offline state, and will set the Reason Code for the Offline Response to be "20xx" – request not valid in current state. The Offline Message will be transmitted to the terminal at the next opportunity the PIN Pad is given to transmit a response.

Direction :	**Terminal → PIN Pad**
Message Type :	"14."
Allowed :	At any time when the PIN Pad is in state 1 (Slide Card), through state 3 (Enter PIN), including the "Please Wait" state. Refund Message must arrive BEFORE the Amount Message is received
Expected Response :	None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "14."
4	2	Refund indicator ASCII – "03"
6	1	ASCII control character – ETX
7	1	LRC check character

Card Swiped Message (19.)

Sent by the PIN Pad to indicate a card swipe has occurred. Only sent if PIN Encouragement is enabled.
This allows the terminal to look up the BIN to determine the Payment Type. The Payment type can then be sent to the PIN Pad so the customer does not have to select a payment type, or to change the customer's selected payment type (i.e. Credit to Debit).

Direction :	**PIN Pad → Terminal**
Message Type :	"19."
Allowed :	Sent to terminal after a card swipe.
Expected Response :	Card Swiped Response Message

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "19."
4	1	Indicates from where account data was derived H – Electronic Track 1 D – Electronic Track 2 (default track to use) T – Manual Track 2 N – No Account Data (not used)
5	1	Track 1 good read indicator 0 Bad Read 1 Good Read ***NOTE:*** If account # from Account message (12.)field is set to '0'
6	1	Track 2 good read indicator 0 Bad Read 1 Good Read
7	1	Reserved (use '0')
8	4	Request Counter

Offset	Length	Description
12	variable	Account number from source listed above (Track 2 default)
M	1	ASCII control character – FS
M+1	variable	Track 1 data
N	1	ASCII control character – FS
N+1	variable	Track 2 data
O	1	ASCII control character – ETX
O+1	1	LRC check character

Card Swiped Response Message (19.)

Sent by the terminal in response to a Card Swipe Message. This message is used to alter the customer payment selection (i.e. Credit to Debit conversion).

Upon receiving the Card Swiped Response, the PIN Pad will bypass the "Select Payment" screen, go to the Please Wait state and process the payment type indicated in the response message. The exception is a Payment Type of "9-Unknown Card" which will cause the PIN Pad to go to the "Select Payment" screen.
After the Card Swiped Response is received by the PIN Pad, the resulting screen will contain a CANCEL button which will return the PIN Pad to the "Select Payment" screen. Pressing CANCEL will allow the customer to select a different payment type without re-swiping their card.

On the "Select Payment" screen, the customer has the option of canceling the previous card swipe, which clears the old MSR data and returns to the "Slide Card" screen.

Direction : **Terminal → PIN Pad**
Message Type : "19."
Allowed : Sent in response to Card Swiped Message
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "19."
4	1	Payment Type Selected 1-Debit 2-Credit 3-EBT Cash 4-EBT Food Stamp 5-Store Payment Type 9-Unknown Card
5	4	Response Counter (Copied from request message)
9	variable	Account number (Copied from request message)
N	1	ASCII control character – ETX
N+1	1	LRC check character

Signature Request Message (20.)

Sent by the terminal to prompt consumer for electronic signature after the Authorization request is received by the terminal.

Direction : **Terminal → PIN Pad**
Message Type : "20."
Allowed : After PIN Pad sends an Authorization request
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "20."
4	Variable	Prompt (up to 5 lines of 40 characters)
M	1	ASCII control character – ETX
M+1	1	LRC check character

Set Variable Message (28.)

Sent by the Terminal to set one of the internal values stored in the PIN Pad.

Direction : **Terminal → PIN Pad**
Message Type : "28."
Allowed : At any time when the PIN Pad is not in the Offline state.
Expected Response : Set Variable Message, Offline Message

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "28."
4	1	Set the response type 1 Send response message 9 Do not send response message
5	1	"1"
6	6	Variable ID 000300 – 000399 Text for various messages that are displayed on the PIN Pad screens. E.g. text for tender buttons, text for Slide card state and Select tender state, etc. 000400 – 000799 miscellaneous PIN Pad variables Examples: Scrolling receipt data Polling for signature data Signature data request Signature parameters – e.g. timeout Enabling and defining tenders PIN and Signature required for each tender Enable/disable PIN Encouragement 000801 Terminal parameter 000802 Payment Type parameter 000803 System date/time setup

Offset	Length	Description
12	Variable	Variable Data (40 chars max)
N	1	ASCII control character – ETX
N+1	1	LRC check character

✓ *Notes:*

1. In case of Terminal parameter, Variable field will contain parameter value preceded by keyword described in parameter INI file. For instance: PINEncryptionMethod=DUKPT
2. In case of Payment Type parameter, Variable field will contain parameter value preceded by Payment Type name and keyword described in parameter INI file. For instance: Debit.ConfirmAmount=Yes
3. The new parameter value will remain effective until PIN Pad reboot or new Set Variable message with this parameter is processed.
4. If variable ID is 000803 variable data should be presented in form mmddyyHHMMSS, where:
   mm month number 01 – 12
   dd day number 01 – 31
   yy last two numbers of year
   HH hours 00 – 23
   MM minutes 00 – 59
   SS seconds 00 – 59

Set Variable Message Response (28.)

Sent by the PIN Pad as a response to a Set Variable Message.

Direction : **PIN Pad→ Terminal**
Message Type : "28."
Allowed : As a response to a Set Variable Message
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "28."
4	1	Status indicator: "0" – success (Different from IBM) "1" – error (Different from IBM)
5	1	ASCII control character – ETX
6	1	LRC check character

Get Variable Message (29.)

Sent by the Terminal to request the data from the PIN Pad.

Direction : **Terminal → PIN Pad**
Message Type : "29."
Allowed : After 20. or 29.
Expected Response : Get Variable response, Offline Message, Reset Message

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "29."
4	2	"10"
6	6	Variable ID 000300 – 000399 Text for various messages that are displayed on the PIN Pad screens. E.g. text for tender buttons, text for Slide card state and Select tender state, etc. 000400 – 000799 miscellaneous PIN Pad variables 000406 – Get Track 1 data 000407 – Get Track 2 data 000551 - 560 – Prompt lines 000700 – Get number of signature blocks 000701 - 712 – Get signature data block 000803 System date/time setup
10	1	ASCII control character – ETX
11	1	LRC check character

Get Variable Message Response (29.)

Sent by the PIN Pad to provide data from the PIN Pad.

Direction : **PIN Pad → Terminal**
Message Type : "29."
Allowed : After 20. or 29.
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "29."
4	2	"20"
6	1	Status: "0" – success (Different from IBM) "1" – error (Different from IBM)

Offset	Length	Description
7	6	Variable ID 000300 – 000399 Text for various messages that are displayed on the PIN Pad screens. E.g. text for tender buttons, text for Slide card state and Select tender state, etc. 000400 – 000799 miscellaneous PIN Pad variables 000406 – Get Track 1 data 000407 – Get Track 2 data 000551 - 560 – Prompt lines 000700 – Get number of signature blocks 000701 - 712 – Get signature data block 000803 System date/time setup
13	Variable	Variable Data Block – data source is identified by Variable ID E.g. if it's a response to get signature data block (000701 – 712), then a block of between 4 and 228 printable ASCII characters that comprise the "uuencoded" segment of the signature data block. When decoded, these will be converted into between 1 and 170 bytes of binary data.
N	1	ASCII control character – ETX
6	1	LRC check character

✓ Notes:

1. ECR can get track data by using 29. request but in this case there is no information returned by the PIN Pad regarding the source of the track data because at this point of transaction ECR has already acquired that information by message 50.
2. **UUencode** is an algorithm which allows transmitting binary data over transmission mediums that do not support other than simple ASCII data.
   Uuencode repeatedly takes in a group of three bytes, adding trailing zeros if there are less than three bytes left. These 24 bits are split into four groups of six which are treated as numbers between 0 and 63. Decimal 32 is added to each number and they are output as ASCII characters which will lie in the range 32 (space) to 32+63 = 95 (underscore). As the result each three input binary data are converted into four ASCII characters.
3. If variable ID is 000803 variable data block will contain mmddyyHHMMSS, where:
   mm month number 01 – 12
   dd day number 01 – 31
   yy last two numbers of year
   HH hours 00 – 23
   MM minutes 00 – 59
   SS seconds 00 – 59

Authorization Request Message (50.)

Sent by the PIN Pad as a response to the Amount Message.

Direction : **PIN Pad→ Terminal**
Message Type : "50."
Allowed : As a response to an Amount Message sent by the terminal.
Expected Response : Authorization Response Message, Amount Message, Reset Message, Offline Message

Offset	Length	Description
0	1	STX
1	3	Message ID – ASCII "50."
4	6	Bank Identification Number (BIN) – from Parameters
10	12	Merchant ID – from Parameters
22	4	Store ID – from Parameters
26	4	Terminal ID – from Parameters
30	4	Merchant Category – from Parameters
34	3	Merchant Country Code – from Parameters
37	5	Merchant City – from Parameters
42	3	Time Zone difference from GMT – from Parameters
45	2	Transaction Code – derived from the Transaction Type selected by the customer and the type of transaction (Purchase, Refund) being performed. Selected from Parameters for the tender type. A Balance Inquiry will use the Purchase Transaction Code for the selected tender.
47	8	PIN Pad Serial Number – Keyed into the PIN Pad during setup. (In the Symbol PIN Pads, this value is entered as the "Terminal ID Number" within the "Merchant Programming" menu of the setup/configuration screen).
55	1	Index Code – always '0' (zero digit character)
56	4	Transaction sequence number – PIN Pad generated number from 0001 to 9999, incremented for each Authorization Request created. This number will "roll over" from 9999 to 0001 if necessary.
60	1	Message Status Code (always '@' character)

Offset	Length	Description
61	1	Data source indicator – PIN Pad indicates the source of the card track data that is located in the “Card Data” field immediately following this one: “H” = Electronic track 1 data (used if card is read by PIN Pad MSR) “X” = Manual track 1 data (used if account number and expiry date are supplied to the PIN Pad by means of an Account Message from the terminal) “D” = Electronic track 2 data (used if card is read by PIN Pad MSR) “T” = Manual track 2 data (used if account number and expiry date are supplied to the PIN Pad by means of an Account Message from the terminal, regardless of the method, keyed or swiped, used to enter the card data at the terminal) The Supermarket and EFT Feature do not support the use of Track-1 data within the Authorization Request Message. ‘1’ the track 1data is read from Amercian Express ExpressPay ‘2’ the track 1 data is read from Master Card PayPass ‘3’ the track 1 data is read from Visa Wave ‘4’ the track 1 data is read from unknown source ‘5’ the track 2data is read from Amercian Express ExpressPay ‘6’ the track 2 data is read from Master Card PayPass ‘7’ the track 2 data is read from Visa Wave ‘8’ the track 2 data is read from unknown source
62	Variable	Card Data – The PIN Pad places one of the following into this field: Electronic Track 2 or Track 1 data (unaltered, except for removal of start sentinel, end sentinel and LRC characters, if these are returned by the PIN Pad MSR device) Manual Track-2 Data (Account #, "=", Expiry Date in MMYY order)
T	1	Field Separator – FS = 0x1C
T + 1	Variable	PIN Information – See the section concerning PIN Information Data for details concerning the contents of this field.
P	1	Field Separator – FS = 0x1C
P + 1	Variable	Transaction Amount – In cents, "000" -> "9999….9" Minimum is 3 digits, maximum is 12 digits ***NOTE:*** This field will never contain a minus sign.
A	1	ETX
A + 1	1	LRC

PIN Information Data

The PIN Information Data field of the Authorization Request will contain different data, depending on whether or not a PIN is required for the payment type involved within the transaction, and also depending on the PIN Encryption Method in use (Master Session or DUKPT).
Note that the use of DUKPT is not supported by the base IBM Supermarket Application.

Master Session – No PIN required

2 characters (always "1@" if no PIN is used)

Master Session – PIN required

23 characters "1J…" conform to 23 character static key encryption, if PIN is used for the selected tender. The 23 character static key data is formatted as follows: "1Jfxxyyaaaaaaaaaaaaaaa"
"1J" = fixed text indicating presence of PIN data within this field
f = a single character that Supermarket EFT Feature uses to indicate the Account Type ('0' = Checking, '1' = Savings).
xx = Maximum PIN Length, a two digit value ("04" - "12", inclusive) that indicates the maximum length PIN that the PIN Pad can generate.
yy = PIN Block Format, a two digit code ("01" - "04", inclusive) that indicates the encryption method used to create the PIN Block. ("01" is expected)
aaaaaaaaaaaaaaaa = PIN Block Data, 64 bits of encrypted PIN Data, expanded to a 16 character hexdump string.

DUKPT – No PIN required

2 characters (always "1@" if no PIN is used)

DUKPT – PIN required

43 characters "1@…" if PIN is used for the selected tender. The 43 character DUKPT data is formatted as follows: "1@fxxyyaaaaaaaaaaaaaaaakkkkkkkkkkkkkkkkkkkk"
"1@" = fixed text indicating presence of PIN data within this field
f = a single character that Supermarket EFT Feature uses to indicate the Account Type ('0' = Checking, '1' = Savings).
xx = Maximum PIN Length, a two digit value ("04" - "12", inclusive) that indicates the maximum length PIN that the PIN Pad can generate.
yy = PIN Block Format, a two digit code ("01" - "04", inclusive) that indicates the encryption method used to create the PIN Block. ("01" is expected)
aaaaaaaaaaaaaaaa = PIN Block Data, 64 bits of encrypted PIN Data, expanded to a 16 character hexdump string.
kkkkkkkkkkkkkkkkkkkk = Key Serial Number data, 80 bits of data generated by the DUKPT encryption algorithm in order to identify the specific key number used when encrypting the PIN data. This is expanded to a 20 character hexdump string.

Authorization Response Message (0**)

Sent by the terminal in response to the Authorization Request built and sent by the PIN Pad (as a response to the Amount Message). There is no Message Type ID as such, just the single '0' followed immediately by the characters of the PIN Pad Serial Number field.

Direction : **Terminal → PIN Pad**
Message Type : "0**" (no specific type)
Allowed : Only as a response to an Authorization Request Message sent by the PIN Pad.
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	1	Message type – always "0"
2	8	PIN Pad Serial Number – from PIN Pad firmware
10	1	Index Code - always '0' (zero digit character)
11	4	Transaction sequence number (0001 through 9999) from original request
15	2	Response code: "AA" – approval "NO" – decline (letters "N" and "O") "NP" – Re-enter PIN "Ex" – Error in response (EFT code clearly shows lowercase 'x' character)
17	6	Approval code – always "000001"
23	6	Date today - in MMDDYY order
29	Variable Optional field	Authorization response display (up to 32 characters) Depending on the EFT Feature Personalization, some Response Display messages may be passed through directly from the host, while others may be generated or replaced by the controller software, depending upon the Response Code stored within the response message that is received from the host. ***NOTE:*** It has been noted that the Supermarket EFT Feature software removes the last character of the Display Message field between the time the response is received from the host and the time this Authorization Response Message is built and sent to the PIN Pad. The PIN Pad will display the data it receives within this message field in its entirety, but has no control over the contents of the field. See the description in the Appendix B Notable EFT Behaviors section for more information.
N	1	ASCII control character – ETX
N+1	1	LRC check character

Parameter Load Request Message (59.)

Sent by the PIN Pad as a response to the Online Request when the Parameter Version Number is different from that currently loaded into the PIN Pad.

Direction : **PIN Pad→ Terminal**
Message Type : "59."
Allowed : As a response to an Online Request issued by the terminal.
Expected Response : Online Message, Reset Message, Offline Message

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "59."
4	8	PIN Pad serial number
12	1	ASCII "1" = load request
13	4	Version number of file to load: For Screen file – "S000" where S is the version For Parameter file – "0PPP" where PPP is the version
17	1	ASCII control character – ETX
18	1	LRC check character

Parameter Load Block Message (9xx)

Sent by the terminal in response to the Parameter or Program Load Request that was sent by the PIN Pad (as a response to the Online Request).

Direction : **Terminal → PIN Pad**
Message Type : "9xx" (where xx is 2-digit record number "01" → "99")
Allowed : As a response to a Parameter or Program Load Request Message sent by the PIN Pad, and then after each successive Parameter Load Block Message sent to the PIN Pad, until a Parameter Load Confirmation Message is sent to the terminal.
Expected Response : No response (if the PIN Pad expects to receive another Parameter Load Block Message), or Parameter Load Confirmation Message, Reset Message, Offline Message

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Parameter load data (starts with "9xx" where xx is the record number). The "xx" portion of the ID is incremented from 01 through 99 for each parameter block, and then rolls over to 01 again.
4	1	Status: 0 - Last Parameter Block 1 - More Parameter Blocks to follow
5	8	PIN Pad Serial Number
13	5	Application Number (not used by PIN Pad application)
18	5	File Number (not used by PIN Pad application)
23	3	Record Number (not used by PIN Pad application)
26	3	Configuration Class (not used by PIN Pad application): 0 - Private Configuration Item, 1 - Public Configuration Item
29	6	Length of transferred data before uuencode (000000 - 000700)

Offset	Length	Description
35	Variable	Transferred data (uuencoded)
N	1	ASCII control character – ETX
N + 1	1	LRC check character

✓ Notes:

1. After application load is completed, PIN Pad does not respond (other than ACK) and reboots.
2. **UUencode** is an algorithm which allows transmitting binary data over transmission mediums that do not support other than simple ASCII data.
   Uuencode repeatedly takes in a group of three bytes, adding trailing zeros if there are less than three bytes left. These 24 bits are split into four groups of six which are treated as numbers between 0 and 63. Decimal 32 is added to each number and they are output as ASCII characters which will lie in the range 32 (space) to 32+63 = 95 (underscore). As the result each three input binary data are converted into four ASCII characters.

Parameter Load Confirmation Message (59.)

Sent by the PIN Pad as a response to the last block of a parameter load block series. If the parameter load was successful, the PIN Pad will then transmit an Online Response indicating the levels of the program and parameters. If the parameter load was unsuccessful, the PIN Pad will transmit an Offline Message, and will enter the Offline state (ACE Uses Online Message instead of the 59. Confirmation Message)

Direction :	**PIN Pad→ Terminal**
Message Type :	"59."
Allowed :	As a response to a series of Parameter Load Block Messages sent by the terminal.
Expected Response :	None. PIN Pad follows this message by sending an Online Response Message to the terminal.

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "59."
4	8	PIN Pad serial number
12	1	"2" = confirmation response
13	1	Status: 0 = Failure 1 = Success
46	1	ASCII control character – ETX
47	1	LRC check character

Payment Setup Request (60.)

Sent by the terminal to add new or update existing payment type.

Direction : **Terminal → PIN Pad**
Message Type : "60."
Allowed : At any time (only expected when PIN Pad is in an Offline state, though
Expected Response : Payment Setup Response

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "60."
4	1	Commit payments flag (ASCII character). If this flag is '0' all entered payments will be saved into temporal storage. If this flag is '1' all previously entered payments will be saved into permanent storage and PIN Pad will expect that this is the last Payment Setup Request.
5	3	The first payment configuration record length
8	1	Record type ASCII character "P" – identifies Payment Type. Payment Type record will update existing Payment Type found by TenderID. Payment Type cannot be added or deleted. "p" – identifies Credit Card. Credit Card record will add the Credit Card to the parameters. In this case all existing Credit Cards will be deleted.
9	Variable	Payment configuration record data (please refer to the Parameter List with Description section below for the detailed description)
M	3	The second payment configuration record length
M + 3	1	Record type
M + 4	Variable	Record data
		(See Note)
N	1	ASCII control character – ETX
N + 1	1	LRC check character

✓ ***NOTE:*** message can contain multiply Payment configuration records with allowance for total message length does not exceed message block length.

Payment Setup Response (60.)

Sent by the PIN Pad as a response to a Payment Setup Request.

Direction : **PIN Pad → Terminal**
Message Type : "60."
Allowed : As a response to a Payment Setup Request Message
Expected Response : None

Offset	Length	Description
0	1	ASCII control character – STX
1	3	Message identifier ASCII – "60."

Offset	Length	Description
4	2	Message processing error status: '00' – No Error '01' – Unknown Record Type '02' – Bad Payment Record Payment ID Field '03' – Bad Payment Record PIN Required Field '04' – Bad Payment Record Amount Confirm Field '05' – Bad Payment Record Account Select Field '06' – Bad Payment Record Purchase Code Field '07' – Bad Payment Record Refund Code Field '08' – Bad Payment Record Account Checksum Field '09' – Bad Payment Record Expiry Date Check Field '10' – Bad Payment Record Account Length Check Field '11' – Bad Payment Record BIN Comparison Field '12' – Bad Payment Record Account Length Value Field '13' – Bad Payment Record Cashback Allowed Field '14' – Bad Payment Record Wrong Length '15' – Bad Payment Record Missing BIN Range '16' – Bad BIN Range Low BIN Field '17' – Bad BIN Range High BIN Field '18' – Error Storing Payment
6	2	If message was processed with error, this field contains number of erroneous Payment configuration record, otherwise '00'
8	1	ASCII control character – ETX
7	1	LRC check character

Parameter List with Descriptions

The following is a detailed description of the Payment configuration Data portions of the Payment Setup messages:

Fields specified with a fixed length must be padded to exactly the length specified.
Numeric fields will be padded with leading zero digits.
Alphanumeric fields will be padded with trailing spaces.
Fields specified with a variable length must be enclosed within quotation marks. The quotation marks must be present, but they may be empty (if a length of zero characters is permitted). The quotation marks are **not** counted as part of the length of the field (e.g. the Source File Name field may contain a string of up to 20 characters to specify the path and filename, in addition to the quotation mark characters that wrap the field).
Fields specified with a range for the length must contain at least the minimum number of digits or characters, and at most the maximum number of characters specified.
Fields are separated by a comma character ("," = 0x2c).

Payment Types or Credit Cards configuration data

Field	Length	Description
Tender ID	2	A 2 digit value from 20 to 49 to indicate the ID of this tender. This value corresponds to the value of the function code defined for the PIN Pad button that selects this payment type. This value is used only within the PIN Pad, and does not correspond in any way to values used within the terminal or store controller for this tender type.
Separator	1	
Tender Name	0 - 20	The full name (up to 20 characters) for this tender. This is currently not used within the application except Credit payment which name is used by application to select Credit Card. The text within this field will be enclosed within quotation marks.
Separator	1	
Need PIN	1	A Y/N flag to indicate whether a PIN is required for this tender. Y = PIN is required N = No PIN required (the Enter PIN state will be bypassed)
Separator	1	
Amount Confirmation	1	A Y/N flag to indicate whether to display the amount for this tender, and allow the customer the opportunity to accept the amount or to cancel the transaction. This option applies to both purchase and refund transactions. If this option is set to Y, the Amount OK prompt may still not appear if the amount within the Amount Message is $0.00 Y = Amount OK prompt shown to customer N = Amount OK prompt is bypassed
Separator	1	
Maximum Cashback	8	An eight-digit value that represents the maximum value (in cents) that may be added to the transaction amount by the customer as cashback. If this value is zero, then cashback will not be allowed for the payment type.
Separator	1	

Field	Length	Description
Account Type Selection Display Message ID	2	A two-digit value that indicates the Display Message ID to be used to prompt the customer for Account Type Selection. If Account Type Selection is not used for this tender, this field should be set to "00". If Account Type Selection is used for this tender, the prompt and buttons defined by the Display Message indicated here will be presented to the customer. ***NOTE:*** - Since the Account Type is placed within the PIN Data in the Authorization Request Message, the tender MUST also have the "Need PIN" flag set to Y. If the "Need PIN" flag is set to N, Account Type Selection will not be performed, regardless of the setting of this field. - The valid values defined for this field are 00, 14, 50 – 79. If this field is omitted in Payment Setup request (60.) type the correspondent parameter will not be changed.
Separator	1	
Purchase Transaction Code	2	A 2-digit value for the "Visa-II" Transaction Code for a Purchase using this tender. This value must be set for each tender defined. This value must match the corresponding EFT Feature Personalization setting within the Supermarket Application.
Separator	1	
Refund Transaction Code	2	A 2-digit value for the "Visa-II" Transaction Code for a Refund using this tender. This value must be set for each tender that supports refund transactions (set to 00 for tenders that do not support refunds). This value must match the corresponding EFT Feature Personalization setting within the Supermarket Application.
Separator	1	
BIN Range Comparison	1	A Y/N flag to indicate whether the account number from the card slide should be tested to confirm that it is within a BIN Range defined for this payment type. Y = The card slide and payment type will be validated to ensure that the account number falls within one of the defined BIN Ranges for the payment type. If so, they will be accepted, insofar as the BIN Range Comparison test is concerned; if not, the error message “Error, Incorrect”/“Card Type” will be displayed, and both the card slide and the payment type will be requested again. N = The BIN Range Comparison test will not be performed, and the card slide and payment type will be accepted without regard for BIN Range comparisons.
Separator	1	

Field	Length	Description
Account Length Comparison	1	A Y/N flag to indicate whether the length of account number from the card slide should be tested to confirm that it is correct, as defined for this payment type. Y = The card slide and payment type will be validated to ensure that the account number length matches one of the defined lengths for the payment type. If so, they will be accepted, insofar as the Account Length test is concerned; if not, the error message "Error, Incorrect" / "Account Length" will be displayed, and both the card slide and the payment type will be requested again. N = The Account Length test will not be performed, and the card slide and payment type will be accepted without regard for length of the account number.
Separator	1	
Expiry Date Checking	1	A Y/N flag to indicate whether the expiry date from the card slide should be tested to confirm that the card has not expired. Y = The card slide and payment type will be validated to ensure that the expiry date has not passed. If the card is not expired, they will be accepted, insofar as the Expiry Date Checking test is concerned; if the card is expired, the error message "Error," / "Card Expired" will be displayed, and both the card slide and the payment type will be requested again. N = The Expiry Date Checking test will not be performed, and the card slide and payment type will be accepted without regard for the expiry date of the card.
Separator	1	
Account Checksum Validation	1	A Y/N flag to indicate whether the account number from the card slide should be tested to confirm that it contains a correct Checksum Digit. Y = The card slide and payment type will be validated to ensure that the account number contains a correct Checksum Digit. If so, they will be accepted, insofar as the Account Checksum Validation test is concerned; if not, the error message "Error, Not Valid" / "Account Number" will be displayed, and both the card slide and the payment type will be requested again. N = The Account Checksum Validation test will not be performed, and the card slide and payment type will be accepted without regard for the checksum digit of the account number.
Separator	1	
Account Lengths	10 x 2	A set of ten 2-digit values for the accepted account number lengths. All ten values must be specified, separated by comma characters. The first zero (00) value encountered will end the list, and all subsequent values will be ignored.
Separator	1	
Low BIN Range 1	1 – 20	Up to 20 digits for the Low BIN Range value. The text within this field will be enclosed within quotation marks. This field must be filled with a valid value.
Separator	1	
High BIN Range 1	1 – 20	Up to 20 digits for the High BIN Range value. The text within this field will be enclosed within quotation marks. This field must be filled with a valid value.
Separator	1	

Field	Length	Description
Low BIN Range 2	0 – 20	Up to 20 digits for the Low BIN Range value. The text within this field will be enclosed within quotation marks. If there is no second BIN Range for the payment type, this field may be left empty (no text between the quotation marks).
Separator	1	
High BIN Range 2	0 – 20	Up to 20 digits for the High BIN Range value. The text within this field will be enclosed within quotation marks. If there is no second BIN Range for the payment type, this field may be left empty (no text between the quotation marks).
Separator	1	
Low BIN Range 3	0 – 20	Up to 20 digits for the Low BIN Range value. The text within this field will be enclosed within quotation marks. If there is no second BIN Range for the payment type, this field may be left empty (no text between the quotation marks).
Separator	1	
High BIN Range 3	0 – 20	Up to 20 digits for the High BIN Range value. The text within this field will be enclosed within quotation marks. If there is no second BIN Range for the payment type, this field may be left empty (no text between the quotation marks).
Separator	1	
Low BIN Range 4	0 – 20	Up to 20 digits for the Low BIN Range value. The text within this field will be enclosed within quotation marks. If there is no second BIN Range for the payment type, this field may be left empty (no text between the quotation marks).
Separator	1	
High BIN Range 4	0 – 20	Up to 20 digits for the High BIN Range value. The text within this field will be enclosed within quotation marks. If there is no second BIN Range for the payment type, this field may be left empty (no text between the quotation marks).
Separator	1	

✓ Notes:

- "Tender ID" values for Payment Types are defined in current application version as follows:
  20 – Credit
  21 – Debit
  22 – EBT Foodstamps
  23 – EBT AFDC
  24 – ACH Check
- "BIN range" fields are optional for Payment Type record and depend on "BIN Range Comparison" parameter value. For Credit Card record must be defined at least one "BIN range" pair. Omitted BIN Range pairs may not contain empty values and separators.

Examples:

071P,20,"Credit",N,N,00000000,00,41,42,N,Y,Y,Y,12,13,14,15,16,17,18,0,0,0,
062P,21,"Debit",Y,Y,00005000,14,51,52,N,N,N,N,0,0,0,0,0,0,0,0,0,0,

076p,20,"VC",N,N,00000000,00,41,41,Y,Y,Y,Y,12,13,15,16,17,18,0,0,0,0,"40","49",
060P,22,"EF",Y,Y,00000000,00,32,32,N,N,N,N,0,0,0,0,0,0,0,0,0,0,

Offline Reason Codes

The following table lists the Offline Reason Code values used by the PIN Pad Application when an Offline Message is transmitted to the terminal.

Code	Description
0000	No Error, the PIN Pad has gone Offline as the result of an Offline Message sent by the terminal.
0800	Error, Lost Communications: The PIN Pad has detected a drop in the DTR signal (this is commonly caused by the terminal resetting the port after a Sign-Off, or after an error.
0801	Error, Message Send Failed: An attempt by the PIN Pad to send a message resulted in either a device failure (PIN Pad O/S or SDK) or the send failed due to repeated retries or NAKs received from the terminal.
0802	Error, Message Build Failed: The PIN Pad encountered an error while building a message to be sent to the terminal.
0803	Error, Signature Capture Failed: The PIN Pad was unable to capture signature data for some reason.
0999	Error, Application, screens or parameters ZIP file unzipping failed.
1000	Error, Request Is Unknown Type: The PIN Pad was unable to determine the Message Type of a message received from the terminal.
1001	Error, Request Not Correct Format: The PIN Pad has repeatedly received a message from the terminal that was not in the correct EFT Feature format (STX, <data>, ETX, LRC), or that contained a bad checksum.
1100	Error, Parameter Load Failed: The PIN Pad received an Online Request specifying a value of “0000” for the Parameter Version Number (signifying it should use its existing parameters), and the PIN Pad has a corrupt (or non-existing) parameter set.
1101	Error, Parameters, Incorrect Format Level: The Format Level value within the Parameter File was not the required level for the version of the PIN Pad application (e.g. Level 2 parameters sent to PIN Pad that expects Level 1). Rebuild the Parameters at the correct Level for the version of the PIN Pad application that is in use.
1103	Error, Parameters, Incorrect Record Count: A difference has been detected between the expected number of records in the Parameter File, and the actual number of records that were processed by the PIN Pad. Rebuild the Parameters.
1104	Error, Parameters, Incorrect LRC: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1105	Error, Parameters, Out Of Sequence: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1106	Error, Parameters, Version Not First Record: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1107	Error, Parameters, Unknown Record Type: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1108	Error, Parameters, Bad Version Record, and Format Level Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1109	Error, Parameters, Bad Version Record, and Target Platform Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1110	Error, Parameters, Bad Communications Record, and Link Level Timeout Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1111	Error, Parameters, Bad Communications Record, and Re-init Delay Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1112	Error, Parameters, Bad Communications Record, and Error Retries Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1113	Error, Parameters, Bad Terminal Record, and Bank ID Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.

Code	Description
1114	Error, Parameters, Bad Terminal Record, and Merchant Number Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1115	Error, Parameters, Bad Terminal Record, and Store Number Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1116	Error, Parameters, Bad Terminal Record, and Terminal Number Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1117	Error, Parameters, Bad Terminal Record, and Category Code Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1118	Error, Parameters, Bad Terminal Record, and Country Code Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1119	Error, Parameters, Bad Terminal Record, and ZIP Code Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1120	Error, Parameters, Bad Terminal Record, and Time Zone Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1121	Error, Parameters, Bad Terminal Record, and Display Timeout Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1122	Error, Parameters, Bad Terminal Record, and Working Key Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1123	Error, Parameters, Bad Payment Record, and Payment ID Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1124	Error, Parameters, Bad Payment Record, and PIN Required Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1125	Error, Parameters, Bad Payment Record, and Amount Confirmation Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1126	Error, Parameters, Bad Payment Record, and Account Select Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1127	Error, Parameters, Bad Payment Record, and Purchase Code Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1128	Error, Parameters, Bad Payment Record, and Refund Code Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1129	Error, Parameters, Bad Display Record, and Display ID Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1130	Error, Parameters, Bad Display Record, and Top Line Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1131	Error, Parameters, Bad Display Record, and Bottom Line Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1132	Error, Parameters, Bad Display Record, and Button Label Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1133	Error, Parameters, Bad Display Record, and Button Function Code Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1134	Error, Parameters, Bad End-Of-Data Record, and Record Count Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1135	Error, Parameters, Bad Display Colour Record, and Display ID Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1136	Error, Parameters, Bad Display Colour Record, and Top Line ForeGround Colour Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1137	Error, Parameters, Bad Display Colour Record, and Top Line BackGround Colour Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1138	Error, Parameters, Bad Display Colour Record, and Bottom Line ForeGround Colour Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.

Code	Description
1139	Error, Parameters, Bad Display Colour Record, and Bottom Line BackGround Colour Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1140	Error, Parameters, Bad Display Colour Record, and Button ForeGround Colour Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1141	Error, Parameters, Bad Display Colour Record, and Button BackGround Colour Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1142	Error, Parameters, Bad User Interface Record, and Screen Colour ID Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1143	Error, Parameters, Bad User Interface Record, and Frame Colour ID Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1144	Error, Parameters, Bad BIN Range Record, and Payment ID Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1145	Error, Parameters, Bad BIN Range Record, and Low BIN Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1146	Error, Parameters, Bad BIN Range Record, and High BIN Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1147	Error, Parameters, Bad BIN Range Record, Error Storing BIN
1148	Error, Parameters, Bad Payment Record, Error Storing Payment
1149	Error, Parameters, Bad Payment Record, and Account Checksum Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1150	Error, Parameters, Bad Payment Record, and Expiry Date Check Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1151	Error, Parameters, Bad Payment Record, and Account Length Check Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1152	Error, Parameters, Bad Payment Record, and BIN Comparison Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1153	Error, Parameters, Bad Payment Record, and Account Length Value Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1154	Error, Parameters, Bad Terminal Record, and PIN Encryption Method Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1155	Error, Parameters, Bad Terminal Record, and Uses Select Language Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1156	Error, Parameters, Bad Terminal Record, and First State Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1157	Error, Parameters, Bad Terminal Record, and Uses Signature Capture Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1158	Error, Parameters, Bad Terminal Record, Cashback Method Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
1159	Error, Parameters, Bad Payment Record, Cashback Allowed Field: A record in the Parameter File is corrupt. Rebuild the Parameter File.
2000	Error, Request Not Valid In Offline State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Offline state.
2001	Error, Request Not Valid In Slide Card State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Slide Card state.
2002	Error, Request Not Valid In Transaction Type State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Transaction Type state.
2003	Error, Request Not Valid In Enter PIN State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Enter PIN state.
2004	Error, Request Not Valid In Amount OK State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Amount OK state.
2005	Error, Request Not Valid In Processing State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Processing state.

Code	Description
2006	Error, Request Not Valid In Completed State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Completed state.
2007	Error, Request Not Valid In ReEnter PIN State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the ReEnter PIN state.
2008	Error, Request Not Valid In LoadingLR State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the LoadingLR state.
2009	Error, Request Not Valid In Loading State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Loading state.
2010	Error, Request Not Valid In SelectLanguage State: The PIN Pad has received a message from the terminal that is not valid when the PIN Pad is in the Select Language state.

States

The PIN Pad responds to a Status Request message with a Status Response containing the current "state" of the PIN Pad application. These states are described below. All PIN Pad display messages shown are examples only, and may be changed by modifying the entries that are used as input to the Parameter Build Utility, then rebuilding and reloading the PIN Pad parameters.

At any time during communications with the terminal, the PIN Pad may detect errors (bad message format, no ACK from terminal, etc.) or may lose the connection to the terminal (DTR or CD lost). In such a situation, the PIN Pad will cancel any transaction, clear any customer entered data, and change to the Offline state.

Offline State = 0	The PIN Pad will display a message (such as "CLOSED"), and will await an Online Message. The PIN Pad will respond with an Offline Message to any other request from the terminal for which a response is allowed (except for Parameter Load Block Messages, which will be ignored, see Notable EFT Behaviors on page 60 for details). The application will confirm the program and parameter version numbers (and initiate loads, if necessary) then the application will respond with an Online Response, and enter the configured initial state. This state will not appear within a Status Response (when Offline, the PIN Pad will respond to a Status Request with an Offline Message).
Select Language State = 2	The PIN Pad will display a message similar to “Please Select Language” / “Choisir La Langue”, together with buttons for the two configured languages (e.g. “English” and “Francais”). Based upon the selection made by the customer, the remainder of the transaction (until the PIN Pad Resets following the Completed state, or Resets due to a Cancel or Reset Message) will use the prompts for the selected language. This state, if configured within the StartSequence of the parameters, will always be presented to the customer first. If this state is not configured within the StartSequence, it will never appear, and the Primary Language prompts from the parameters will be used for all states. Following the button press by the customer, the PIN Pad will change to the Slide Card or the Transaction Type state, as specified by the StartSequence within the Parameters. If a Signature Capture Request Message is received by the PIN Pad, the PIN Pad will change to the Signature Capture state.

Slide Card State = 1	The PIN Pad will display "Slide Card" on the display. The PIN Pad will then wait for MSR data from the customer, or for an Account Message from the terminal. If the parameter configuration specifies that Slide Card is the initial state, there will not be a CANCEL button available; otherwise there will be a CANCEL button. Once the account number is acquired (from the MSR or terminal), the PIN Pad will determine whether the payment type has been selected. If the payment type has not been selected, the PIN Pad will change to the Transaction Type state. If the payment type has already been selected, the PIN Pad will perform any necessary Expiry Date, Check Digit, BIN Range, and Account Length checks, as specified by the parameters for the payment type. If any of these tests fail, an error message will be displayed, and the PIN Pad will return to the Transaction Type state. If all tests pass, the PIN Pad will change to the next appropriate state (Select Account, Enter PIN, Cashback Prompt, Amount OK, Please Wait, or Processing). If the CANCEL button is present, and is pressed, the PIN Pad will clear any data pertaining to the transaction, and it will change to the configured initial state, and it may transmit a Reset Message to the terminal (if the Amount Message has been received from the terminal).
Transaction Type State = 2	If the parameters specify that there is only one payment type, this state will be bypassed entirely, with the PIN Pad automatically selecting the payment type, and the PIN Pad changing immediately to the next appropriate state. The PIN Pad will display "Select / Payment Type" and a set of touch screen buttons representing payment types, as defined by the parameters. Sub-menus, if implemented, are also processed while within this state. If the parameter configuration specifies that Transaction Type is the initial state, there will not be a CANCEL button available; otherwise there will be a CANCEL button. If the CANCEL button is present, and is pressed, the PIN Pad will clear any data pertaining to the transaction. It will return to the Slide Card state, and it may transmit a Reset Message to the terminal (if the Amount Message has been received from the terminal). Once the customer selects a payment type, the PIN Pad will evaluate the parameters for the selected payment type. If the parameter configuration specifies that Transaction Type is the initial state, the PIN Pad will then change to the Slide Card state. If the card information has already been acquired, the PIN Pad will perform any necessary Expiry Date, Check Digit, BIN Range, and Account Length checks, as specified by the parameters for the payment type. If any of these tests fail, an error message will be displayed, and the PIN Pad will return to the Slide Card state. If the payment type parameters indicate that an Account Selection is required, the PIN Pad will change to the Select Account state. If no Account Selection is required, and the payment type parameters indicate that a PIN is required, the PIN Pad will change to the Enter PIN state. If no Account Selection or PIN is required, and the Amount Message has been received from the terminal, and the Amount value is zero ($0.00), the PIN Pad will proceed to the Processing state. If no Account Selection or PIN is required, and the Amount Message has been received from the terminal, and the payment type parameters indicate that Amount Confirmation is required, the PIN Pad will proceed to the Amount OK state (or to the Refund OK state, if a Refund Message has also been received). If no Account Selection or PIN is required, and the Amount Message has not been received from the terminal, the PIN Pad will change to the Please Wait state. If no Account Selection or PIN is required, and no Amount Confirmation is required, and the Amount Message has been received from the terminal, the PIN Pad will proceed to the Processing state.

Select Account State = 2	The PIN Pad will display "Select / Account Type" and a set of touch screen buttons representing account types, as defined by the parameters. If the CANCEL button is pressed, the PIN Pad will clear any data pertaining to the transaction, it will return to the Slide Card state, and it may transmit a Reset Message to the terminal (if the Amount Message has been received from the terminal). Once the customer selects one of the Account Types from the menu, the PIN Pad will proceed to the Enter PIN state. (***NOTE:*** Due to the way the IBM Supermarket EFT Feature has been implemented at the terminal, any payment type that uses account selection must also require a PIN. Therefore, the next state for the PIN Pad application is always Enter PIN (see Notable EFT Behaviors on page 60 for details) ***NOTE:*** The value to be used for this state within a Status Response Message is not defined by IBM. In order to meet the needs of the terminal EFT software that specifically tests in various places for states that are: less than 2, equal to 3, and 4 or greater, this state will return a value of 2 within a Status Response Message. It is expected that this will allow the IBM EFT software to operate in its proper manner. See the discussion of this within Notable EFT Behaviors section on page 60.
Enter PIN State = 3	The PIN Pad will display "Enter PIN / and Press OK" on the display, and will then wait for the user to enter their PIN. As the user enters their PIN, asterisks will be displayed in place of the PIN digits, replacing the lower line of the display. The Clear key may be used, after 1 or more digits have been entered, to clear any input and start PIN entry over again. If the CANCEL button is pressed, the transaction will be cancelled, the PIN Pad will clear any data pertaining to the transaction, it will return to the configured initial state, and it may transmit a Reset Message to the terminal (if the Amount Message has been received from the terminal). Once the PIN has been entered, and the customer has pressed the OK or Enter key, the PIN Pad will proceed to the next state as follows: If the Amount Message has been received from the terminal, and Amount Confirmation is required, and Cashback is allowed, and the Cashback Method is CashbackAmount, and the transaction is a normal purchase, and the Amount value is not zero ($0.00), the PIN Pad will change to the CashbackPrompt state. If the Amount Message has been received from the terminal, and Amount Confirmation is required, and the Amount value is not zero ($0.00), the PIN Pad will change to the Amount OK state (or to the Refund OK state, if a Refund Message has been received). If the Amount Message has been received from the terminal, and either Amount Confirmation is not required, or the Amount value is zero ($0.00), the PIN Pad will proceed to the Processing state. If the Amount Message has not been received from the terminal, the PIN Pad will proceed to the Please Wait state.
Cashback Prompt State = 4	This state will only be available if the parameters configuration specifies that the CashbackMethod is CashbackAmount. The PIN Pad will display “Would you like” / “Cashback?” and a set of buttons labeled "YES", “NO”, and "CANCEL", and wait for the customer to make a selection. If “YES” is chosen, the PIN Pad will change to the Cashback Amount state. If the customer selects “NO”, the PIN Pad will proceed to the Amount OK state. If the customer selects “CANCEL”, the PIN Pad will clear any data pertaining to the transaction, it will return to the configured initial state, and it will transmit a Reset Message to the terminal.

Cashback Amount State = 4	This state will only be available if the parameters configuration specifies that the CashbackMethod is CashbackAmount. The PIN Pad will display “Enter Cashback Amount” and a "CANCEL" button. Depending on the configuration in parameters, buttons for “OK” and “CLEAR” may be displayed, as well as buttons with pre-determined dollar amounts (e.g. “$20”, “$40”, etc.). If the customer enters an amount at the keypad and selects “OK” or presses the ENTER key, the PIN Pad will verify the entered amount against the MaximumCashback value for the payment type. If the customer presses one of the pre-defined amount buttons, the configured cashback amount will be selected, and the PIN Pad will verify the amount against the MaximumCashback value for the payment type. If the cashback amount is too large, the OverCashbackLimit message will be displayed, and the PIN Pad will remain in the CashbackAmount state. If the cashback amount entered or selected by the customer is within the accepted limit, the PIN Pad will change to the Amount OK state. If the customer presses the CLEAR button, any currently entered amount will be cleared, and the PIN Pad will remain in the Cashback Amount state. If the customer selects “CANCEL”, the PIN Pad will clear any data pertaining to the transaction, it will return to the configured initial state, and it will transmit a Reset Message to the terminal.
Amount OK State = 4	The PIN Pad will display the amount and a set of buttons labeled "OK", and "CANCEL", (a “NEW AMOUNT” button will be available if the configured CashbackMethod is set to NewTotalAmount), and will wait for the customer to make a selection. If “NEW AMOUNT” is available and is chosen, the PIN Pad will change to the EnterNewAmount state. If the customer selects “OK”, the PIN Pad will proceed to the Processing state. If the customer selects “NEW AMOUNT” and then completes entry of a new amount by pressing “ENTER”, the PIN Pad will proceed to the Processing state. If the customer selects “CANCEL”, the PIN Pad will clear any data pertaining to the transaction, it will return to the Slide Card state, and it will transmit a Reset Message to the terminal.
Enter New Amount State = 4	This state will only be available if the parameters configuration specifies that the CashbackMethod is NewTotalAmount. The PIN Pad will display “Enter New Amount” and a set of “OK”, “CLEAR”, and "CANCEL" buttons. If the customer enters an amount at the keypad and selects “OK” or presses the ENTER key, the PIN Pad will verify the entered amount against the purchase amount and the MaximumCashback value for the payment type. If the entered amount is too large, the OverCashbackLimit message will be displayed, and the PIN Pad will remain in the Enter New Amount state. If the amount entered by the customer is within the accepted limit, the PIN Pad will change to the Processing state. If the customer presses the CLEAR button, any currently entered amount will be cleared, and the PIN Pad will return to the Amount OK state. If the customer selects “CANCEL”, the PIN Pad will clear any data pertaining to the transaction, it will return to the configured initial state, and it will transmit a Reset Message to the terminal.

Please Wait State = 2	The PIN Pad is waiting for the terminal to transmit the Amount Message, and cannot continue without it. The display will show "Please Wait" / "For Cashier…", and the PIN Pad will wait for the Amount Message to arrive, or for the customer to press the CANCEL button. If the Amount Message arrives, the PIN Pad will change to the Cashback Prompt, the Amount OK state, or to the Refund OK state (if a Refund Message has been received from the terminal), depending on the configuration of the selected payment type. If a Reset Message arrives, the PIN Pad will clear any data pertaining to the transaction, and it will return to the configured initial state. If the user presses the CANCEL button, the PIN Pad will clear any data pertaining to the transaction, and it will return to the configured initial state. It will not transmit a Reset Message to the terminal, since the Amount Message was not received from the terminal. ***NOTE:*** The value to be used for this state within a Status Response Message is not defined by IBM. In order to meet the needs of the terminal EFT software that specifically tests in various places for states that are: less than 2, equal to 3, and 4 or greater, this state will return a value of 2 within a Status Response Message. It is expected that this will allow the IBM EFT software to operate in its proper manner. See the discussion of this within Appendix B Notable EFT Behaviors
Processing State = 5	Both the terminal operator and the customer have completed entering all required data. The PIN Pad will display "Processing…", and will build and send an Authorization Request Message appropriate for the type of transaction being performed. The PIN Pad will wait for a message from the terminal. There will not be a CANCEL button active at this point. The transaction can only be cancelled through a Reset Message from the terminal, in which case the PIN Pad will clear all data pertaining to the transaction and will return to the configured initial state. The PIN Pad may receive an Authorization Response Message, which will be processed in order to determine the contents of the Response Code field. If the Response Code is “NP”, the PIN Pad will change to the ReEnter PIN state. Any other Response Code indicates either an approval or a decline of the transaction, and will cause the PIN Pad to change to the Completed state. The PIN Pad may receive an Amount Message, indicating that the transaction amount, as modified by the customer, was not acceptable to the terminal. In such a case, the PIN Pad will change to the Cashback Prompt state, or the Amount OK state.
Completed State = 6	The PIN Pad has received an Authorization Response Message from the terminal. The status of the response it contains will be determined (Approved or Declined), and the result displayed on the PIN Pad. The PIN Pad will remain in the Completed state until the terminal sends a Reset Message. When the Reset Message is received, the PIN Pad will clear all data pertaining to the transaction and will then change to the configured initial state.
ReEnter PIN State = 7	The PIN Pad will re-prompt the customer for his/her PIN. If the customer presses the CANCEL button, the PIN Pad will send a Reset Message to the terminal and will clear all data pertaining to the transaction, and will change to the configured initial state. If the customer enters their PIN and presses the OK button, the PIN Pad will change to the Processing state.
Loading-LR State = 8	The PIN Pad will display a message similar to "Parameter Load" / "Requested", and will display this message until a Parameter Load Block is received. When the first Parameter Load Block is received the PIN Pad will change to the Loading state. If the PIN Pad receives any other message, it will respond with an Offline Message (if permitted) and change to the Offline state.

Loading State = 9	The PIN Pad will display a message similar to "Loading Parameters" / "Ver. NNNN T XX" ("NNNN" is the Parameter Version number, "T" is a character representing the type of record currently being processed, and "XX" is the 2-digit Record ID of the record being processed), and will update this message to show the progress of the parameter load. When the last record has been received, and the load has been successful, a Parameter Load Confirmation Response will be sent to the terminal. The new set of Parameters will be activated at this point. If the load was successful, the Parameter Load Confirmation Response will be followed by an Online Response being sent to the terminal, and the PIN Pad will change to the configured initial state. If, at any time, the load fails or is not successful, the PIN Pad will send an Offline Message, and the PIN Pad will change to the Offline state.
Signature Capture State = 10	The PIN Pad will display a message similar to "Please Sign Within" / "The Space Below", together with a set of Buttons for "CLEAR", "ENTER", and "CANCEL", and a box outline to enclose the active signature area of the screen. If the customer presses the "CLEAR" button, the signature capture data and the screen area will be cleared. If the customer presses the "OK" button, the signature capture data will be accepted, and a series of one or more Get Variable Response Messages will be sent to the terminal. The PIN Pad will then return to the configured initial state. If the customer presses the "CANCEL" button, the PIN Pad will send a Reset Message to the terminal, and will then return to the configured initial state.

SCENARIOS

Message Flows

The PIN Pad application will process all tenders in a similar manner, with differences in the flow of the transaction arising due to customer choices and actions (tender type, changing amount), parameter configuration (PIN Required, Amount Confirmation options), and unexpected circumstances (failure to read card at PIN Pad MSR, incorrect PIN, etc.).

The scenario shown below describes a typical purchase or refund transaction.

Please note that in the scenarios illustrated in this section, **all terminal display messages and keying sequences are approximations of what may actually be used at the terminal.** This document describes the operation of the PIN Pad application only, and does not propose to change the way in which the terminal application operates.

Credit/Debit/EBT Transaction Flow, Cashier initiates tender

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Slide Card"	1			"Total 9.99"	PIN Pad at idle state, terminal waiting for operator to tender
		1		Tender		Operator tenders with EFT tender
		1	**← Amount Message**		"Wait For PIN Pad Or" "Clear To Cancel"	Terminal must wait for customer to slide card and select payment type, and for Authorization Request to be sent by PIN Pad
	"Slide Card"	1				PIN Pad at idle state
(slide a card)		1				Customer slides credit card at PIN Pad
The customer is now presented with a list of payment types, as configured by the PIN Pad parameters.						
	"Select" "Payment Type"	2				PIN Pad offers menu of payment types
Press tender button		2				Customer selects a button from the list of payment types offered at PIN Pad. Also select from SubMenu if offered.
Obtain PIN if it is required						

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
Obtain CashBack amount if it is allowed						
	"Amount OK?"	4				Customer verifies the Amount of the purchase
Press OK button		4				Customer accepts amount as displayed.
	"Processing…" "Please Wait"	5	**Authorization Request Message →**			PIN Pad sends request to terminal (and ultimately to host)
		5			"Processing" "Please Wait…"	Terminal passes the Authorization Request back to the store controller, and the host, and both the terminal and the PIN Pad wait for the response.
		5	**← Get Variable Data Request 29.10000406**			Terminal sends a request to get the track1 data which was read from the card swipe
		5	**Get Variable Data Response → 29.20000406FullTrackData**			PIN Pad returns the full track 1 data
Obtain an electronic signature if it is required (See Signature Capture below)						
		5	**← Authorization Response Message**			Terminal receives response from host and forwards it to PIN Pad
	"Approved"	6			"Approved"	PIN Pad and terminal display result to customer and operator The message displayed at the PIN Pad is extracted from the Authorization Response Message.
		6	**← Reset Message**			Terminal finishes transaction and resets PIN Pad in preparation for next transaction or tender
	"Slide Card"	1			"Enter item"	PIN Pad and terminal both ready for next transaction or tender

Credit/Debit/EBT Transaction Flow, Customer initiates tender

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Slide Card"	1			"Total 9.99"	PIN Pad at idle state, terminal waiting for operator to tender
(slide a card)		1				Customer slides credit card at PIN Pad
The customer is now presented with a list of payment types, as configured by the PIN Pad parameters.						
	"Select" "Payment Type"	2				PIN Pad offers menu of payment types
Press tender buttons		2				Customer selects a button from the list of payment types offered at PIN Pad. Also select from SubMenu if offered.
	"Please Wait" "For Cashier…"	2				PIN Pad waiting for amount message
		2		Tender		Operator tenders with EFT tender
		2	**← Amount Message**		"Processing" "Please Wait…"	Terminal must wait for Authorization Request to be sent by PIN Pad
Obtain PIN if it is required (may occur before Amount Message)						
PIN Pad obtains the CashBack amount if it is required for the specified tender in parameter settings and allowed in the Amount Message. (occurs after the Amount Message is received)						
	"Amount OK?"	4			"Wait For PIN Pad Or" "Clear To Cancel"	Customer verifies the Amount of the purchase
Press OK button		4				
	"Processing…" "Please Wait"	5	**Authorization Request Message →**		"Processing" "Please Wait…"	PIN Pad sends request to terminal (and ultimately to host)
		5				Terminal passes the Authorization Request back to the store controller, and the host, and both the terminal and the PIN Pad wait for the response.
			← Get Variable Data Request 29.10000406			Terminal sends a request to get the track1 data which was read from the card swipe
			Get Variable Data Response → 29.20000406FullTrackData			PIN Pad returns the full track 1 data
Obtain an electronic signature if it is required (See Signature Capture below)						
		5	**← Authorization Response Message**			Terminal receives response from host and forwards it to PIN Pad
	"Approved"	6			"Approved"	PIN Pad and terminal display result to customer and operator

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
						The message displayed at the PIN Pad is extracted from the Authorization Response Message.
		6	**← Reset Message**			Terminal finishes transaction and resets PIN Pad in preparation for next transaction or tender
	"Slide Card"	1			"Enter item"	PIN Pad and terminal both ready for next transaction or tender

Account Number Entered at Terminal

This scenario illustrates the differences when the account number is entered manually or read through the MSR at the terminal instead of at the PIN Pad.
No PIN or Signature is required.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
The customer can slide their card, select transaction type, select account (if necessary), and enter a PIN (if necessary) prior to the terminal operator totalling the transaction and pressing the EFT tender key.						
	"Slide Card"	1			"Total 9.99"	PIN Pad at idle state, terminal waiting for operator to tender
		1		Tender		Operator tenders with EFT tender
		1	**← Amount Message**		"Wait For PIN Pad Or" "Clear To Cancel"	Terminal must wait for customer to confirm amount, and for Authorization Request to be sent by PIN Pad
			← Set Payment Type Message (Optional) 04.020999			Operator specifies Payment Type
If the customer is unable to slide the card successfully, the terminal operator may enter the card account number and expiry date at the terminal (or slide the card through the terminal keyboard MSR)						
(slide a card)	"Error reading card"	1			"'Slide Card'"	Customer slides credit card at PIN Pad, possibly repeating several times as the PIN Pad fails to get a good read…
	"Slide Card"	1		Account and Expiry ENTER	"1299/1234567"	Operator keys in the customer's expiry date and account number at the terminal, then presses ENTER. Operator may also slide card at terminal MSR device.
		1	**← Account Message**		"'Slide Card'"	Terminal sends Account to PIN Pad. Terminal must wait for customer to confirm amount, and for Authorization Request to be sent by PIN Pad
Receipt of the Account Message is sufficient to cause the PIN Pad to change to the next state. The customer is now presented with a list of payment types, as configured by the PIN Pad parameters If Set Payment Type has not been sent by the terminal.						

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Select" "Payment Type"	2			"'Select'" / "'Payment Type'"	PIN Pad offers menu of payment types
Press tender button		2				Customer selects a button from the list of payment types offered at PIN Pad
			Set Payment Type Response → (Optional) 04.000999			Payment Type response
… The remainder of this scenario proceeds in a manner similar to the Credit transaction…						

Amount NOT OK

This scenario illustrates the differences when the payment type selected by the customer is configured to require Amount Confirmation by the customer, and the customer chooses to enter a new amount.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
The start of the transaction occurs normally, and is therefore not shown here.						
	"Is Amount OK?" "$9.99"	4				PIN Pad prompts customer to confirm amount
Press NEW AMOUNT button		4				Customer decides to change the amount.
	"Enter new amount" "$0.00"	4				PIN Pad prompts customer to enter a new amount
Press 2 key	"Enter new amount" "$0.02"	4				Customer begins entering new amount of $29.99
Press 9 key	"Enter new amount" "$0.29"	4				Customer continues entering new amount of $29.99
Press 9 key	"Enter new amount" "$2.99"	4				Customer continues entering new amount of $29.99

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
Press 9 key Press OK	"Enter new amount" "$29.99"	4				Customer finishes entering new amount of $29.99
	"Processing…" "Please Wait"	5	**Authorization Request Message →**			PIN Pad sends request to terminal (and ultimately to host) with the newly entered amount in message
… The remainder of this scenario proceeds in a manner similar to the basic transaction…						

PIN Re-Entry

This scenario illustrates the differences when the PIN is rejected by the host
The differences are highlighted in gray.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
The start of the transaction occurs normally, and is therefore not shown here.						
	"Processing…" "Please Wait"	5	**Authorization Request Message →**			PIN Pad sends request to terminal (and ultimately to host)
		5			"Processing…"	Terminal passes the Authorization Request back to the store controller, and the host, and both the terminal and the PIN Pad wait for the response.
		5	**← Authorization Response Message**			Terminal receives response from host and forwards it to PIN Pad
If the tender selected by the customer required a PIN, and the PIN was not correct, the host may respond with a "Retry PIN" response ("NP" in response code field of Authorization Response). The terminal and the PIN Pad will detect this situation, and the PIN Pad will prompt the customer to re-enter their PIN.						
	"Re-Enter PIN" "Then press OK"	7			"Waiting for" / "Customer input"	PIN Pad and terminal recognize "NP" PIN Retry response and re-prompt customer for PIN
Enter PIN digits, then OK		7				Customer completes PIN entry
	"Processing…" "Please Wait"	5	**Authorization Request Message →**			PIN Pad sends request with new PIN block to terminal (and ultimately to host)
The resulting response from the host may again contain a "NP" response code, causing the Re-Enter PIN procedure to be repeated. This can continue as long as the host continues to respond with Re-Enter PIN responses.						
The remainder of the transaction proceeds normally and therefore is not shown here…						

Signature Capture

This scenario illustrates the gathering of electronic signature data.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
Signature Capture begins only after an Approval is received from the host. No Signature is requested if the transaction is declined.						
	"Processing…" "Please Wait"	5	**Authorization Request Message →**		"Processing" "Please Wait…"	PIN Pad sends request to terminal (and ultimately to host)
		5				Terminal passes the Authorization Request back to the store controller and the host. Both the terminal and the PIN Pad wait for the response.
			← Get Variable Data Request 29.10000406			Terminal sends a request to get the track1 data which was read from the card swipe
			Get Variable Data Response → 29.20000406FullTrackData			PIN Pad returns the full track 1 data
						Host Approval is received
			← Signature Request 20.			Terminal request for PIN Pad to gather signature data
			← Get # Signature Blocks 29.10000712			Ask PIN Pad for number of signature blocks. If signature not completed this responds with 0 blocks. Repeat this until the number of blocks are not 0.
			Signature Blocks response → 29.200007123			PIN Pad returns the number of signature blocks available
			← Get each signature block 29.10000700 - 702			Make multiple requests to the PIN Pad to read each block – up to 12 blocks. In this case blocks 700, 701,702
			Signature Blocks → 29.20000700 - 702			Response to each request block request.
		5	**← Authorization Response Message**			Terminal receives response from host and forwards it to PIN Pad
Continue with the remainder of the transaction						

PIN Encouragement Credit/Debit Transaction Flows, Cashier initiates tender

The flow for this scenario is the same as the flow for non-PIN Encouragement Credit/Debit flow.

PIN Encouragement Credit/Debit Transaction Flow, Customer initiates tender

In this scenario, the customer swipes a Dual-Purpose card at the PIN Pad, the PIN Pad notifies EPS of the swipe, and EPS notifies the PIN Pad to process the card as either a Credit card or a Debit card. Cashback and PIN requirements remain the same as for non-PIN Encouragement tenders.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Slide Card"	1		Scan items		PIN Pad at idle state, terminal scanning item
(slide a card)		1				Customer slides a dual purpose debit card at the PIN Pad
	"Please Wait" "for cashier"	11	**Card Swiped Message →**	Scan items		PIN Pad sends 19. message with BIN and waits for a response
EPS does a BIN lookup to determine if the card should be processed as a Debit Card.						
			← Card Swiped Response	Scan items		EPS responds indicating the Payment Type
If the Payment Type is Unknown, the customer is now presented with a list of payment types, as configured by the PIN Pad parameters. Else go to the payment processing.						
	"Select" "Payment Type"	2				PIN Pad offers menu of payment types
Press tender button		2				Customer selects a button from the list of payment types offered at PIN Pad. Also select from SubMenu if offered.
	"Processing…" "Please Wait"					
PIN Pad obtains PIN if it is required for the specified tender. If customer presses OK but does not enter a PIN, then the PIN Pad will go to state 2, Transaction Type (above) and PIN Pad flow will be according to the customer selection.						
	"Processing…" "Please Wait"			Total Cashier Presses Credit or Debit Key	"Wait For PIN Pad Or" "Clear To Cancel"	Cashier takes total and tenders the transaction
			← Amount Message			Amount of Purchase sent to PIN Pad
PIN Pad obtains the CashBack amount if it is required for the specified tender in parameter settings and allowed in the Amount Message (occurs after the Amount Message is received).						
	"Amount OK?"	4				Customer verifies the amount of the purchase
Press OK button		4				

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Processing…" "Please Wait"	5	**Authorization Request Message →**		"Processing" "Please Wait…"	PIN Pad sends request to terminal (and ultimately to host)
		5				Terminal passes the Authorization Request back to the store controller, and the host, and both the terminal and the PIN Pad wait for the response.
			← Get Variable Data Request 29.10000406			Terminal sends a request to get the track1 data which was read from the card swipe
			Get Variable Data Response → 29.20000406FullTrackData			PIN Pad returns the full track 1 data
Obtain an electronic signature if it is required (See Signature Capture below)						
		5	**← Authorization Response Message**			Terminal receives response from host and forwards it to PIN Pad
	"Approved"	6			"Approved"	PIN Pad and terminal display result to customer and operator The message displayed at the PIN Pad is extracted from the Authorization Response Message.
		6	**← Reset Message**			Terminal finishes transaction and resets PIN Pad in preparation for next transaction or tender
	"Slide Card"	1			"Enter item"	PIN Pad and terminal both ready for next transaction or tender

Refund transaction

Refunds - similar to purchases, but with Refund Message arriving at PIN Pad prior to Amount Message
This scenario illustrates the differences when the transaction being performed is a refund.
Differences from a purchase are highlighted in gray.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Slide Card"	1			"Total 9.99-"	PIN Pad at idle state, terminal waiting for operator to tender (note: terminal has negative balance due, indicating a refund owing to the customer)
The start of the transaction occurs normally, and is therefore not shown here.						
		2		Tender		Operator tenders with EFT tender
		2	**← Refund Message**		"Wait For PIN Pad Or" "Clear To Cancel"	Terminal must inform PIN Pad that the transaction is a refund…it does this by sending a Refund Message before sending the Amount Message.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
		2	**← Amount Message**			Terminal must wait for customer to confirm amount, and for Authorization Request to be sent by PIN Pad
	"Is Refund OK?" "$9.99"	4				PIN Pad prompts customer to confirm amount (***NOTE:*** During a refund, the customer is NOT permitted to alter the amount, regardless of the configuration of the tender)
Press OK button		4				Customer OKs the amount
The remainder of the transaction proceeds normally and therefore is not shown here…						

Balance Inquiry transaction

The following scenario illustrates a balance inquiry transaction. This transaction follows the standard flow, as shown above for a purchase, except that there is no amount (and therefore no amount confirmation or amount change), and the balance in the selected account is shown on the PIN Pad display. These differences are highlighted in gray.

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Slide Card"	1			"Enter item"	PIN Pad at idle state, terminal waiting for operator to begin a transaction
		1		Press 13 SIGNON	"Enter Tender Variety…"	Operator initiates Balance Inquiry at terminal
		1		Tender	"Wait For PIN Pad Or" "Clear To Cancel"	Operator selects EFT tender
		1	**← Amount Message**			Terminal must wait for Authorization Request to be sent by PIN Pad. Amount Message has 0.00 for amount (therefore, no Amount Confirmation, regardless of tender configuration)
Regardless of the configuration of the Amount Confirmation parameter of the customer selected payment type, the customer will not be prompted to confirm the amount, since the amount value sent to the PIN Pad is always $0.00 during a balance inquiry.						
The remainder of the transaction proceeds normally until the point when the Response Message is received from the host. This is not shown in this example.						
		5	**← Authorization Response Message**		"Processing…"	Terminal receives response from host and forwards it to PIN Pad
	"Balance $99.99"	6			"Approved"	PIN Pad and terminal display result to customer and operator. If successful, the PIN Pad display shows the account balance from the host display message field of the response.
		6	**← Reset Message**			Terminal finishes transaction and resets PIN Pad in preparation for next transaction
	"Slide Card"	1			"Enter item"	PIN Pad and terminal both ready for next transaction

Communications Error Handling

The PIN Pad enters the Offline state in response to an Offline message from the terminal (sent when the terminal operator signs off). The PIN Pad also enters the offline state when it encounters an error while communicating with the terminal.

This example illustrates the behavior of the PIN Pad when it experiences an error during communications with the terminal. In the example below, the PIN Pad loses the connection to the terminal during the period when it is awaiting the Amount Message from the terminal. The PIN Pad drops into Offline state, and then re-establishes the communication link with the terminal.

PIN Pad				**Terminal**		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Slide Card"	1			"Total 9.99"	PIN Pad at idle state, terminal waiting for operator to tender
(slide a card)		1				Customer slides card at PIN Pad
	"Select" "Payment Type"	2				PIN Pad offers menu of payment types
Press tender button		2				Customer selects from payment types offered at PIN Pad
	""Please Wait" "For Cashier…"…"	2				PIN Pad must wait for Amount Message from terminal
	"Offline"	0				PIN Pad detects error, changes to Offline state and recovers from communications error
		0		9.99 EFT-Tender		Operator tenders with EFT tender
		0	**← Amount Message**		"Wait For PIN Pad Or" "Clear To Cancel"	Terminal must wait for customer to confirm amount, and for Authorization Request to be sent by PIN Pad
		0	**Offline Message →**		"PIN Pad Error"	PIN Pad responds with Offline Message, terminal displays error message to operator
		0		Press CLEAR key	"Total 9.99"	Operator clears error message from terminal
		0	**← Online Message**			Terminal attempts to reopen PIN Pad
	"Slide Card"	1	**Online Message →**			PIN Pad reopened, returns to idle state with no customer data remaining from before the error
		1		9.99 EFT-Tender		Operator tenders with EFT tender
		1	**← Amount Message**		"Wait For PIN Pad Or" "Clear To Cancel"	Terminal must wait for customer to confirm amount, and for Authorization Request to be sent by PIN Pad
(slide a card)		1				Customer must slide card at PIN Pad again, since the data from the previous slide was lost

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Select" "Payment Type"	2				PIN Pad offers menu of payment types
Press tender button		2				Customer must again select from payment types offered at PIN Pad (original selection was lost when PIN Pad went Offline).
	"Processing…" "Please Wait"	5	**Authorization Request Message →**			PIN Pad sends request to terminal (and ultimately to host)
		5	**← Authorization Response Message**		"Processing…"	Terminal receives response from host and forwards it to PIN Pad
	"Approved 9.99"	6			"Approved"	PIN Pad and terminal display result to customer and operator
		6	**← Reset Message**			Terminal finishes transaction and resets PIN Pad in preparation for next transaction
	"Slide Card"	1			"Enter item"	PIN Pad and terminal both ready for next transaction

Offline to Online Transition

The scenarios below illustrate the flow of messages when an operator "signs-on" to the terminal, thereby bringing the PIN Pad to the Online state.

Basic Initialization: No program or parameter load required

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Closed"	0			"Closed"	PIN Pad Offline, terminal waiting for operator to sign on
		0		999/999 Sign-On		Operator enters ID and password to sign on
		0	**← Online Request**			Terminal sends Online Request to PIN Pad.
		0	**Online Response →**		"Enter Item"	PIN Pad has same levels of program and parameters as terminal specified, so no loads required.
	"Slide Card"	1				PIN Pad changes to Online state

Partial Initialization: No program load required, parameter load is necessary

PIN Pad				Terminal		
Action	**Display**	**State**	**Message Flow**	**Action**	**Display**	**Description**
	"Closed"	0			"Closed"	PIN Pad Offline, terminal waiting for operator to sign on
		0		999/999 Sign-On		Operator enters ID and password to sign on
Terminal may display an indication that the PIN Pad is loading (if Supermarket is configured to do so), and will then proceed normally, allowing item entry, etc.						
		0	**← Online Request**		"Enter Item"	Terminal sends Online Request to PIN Pad.
	"Parameter Load" "Requested…"	8	**Parameter Load Request →**			PIN Pad determines that a load of parameters is required and issues a Request for a load.
	"Loading Parameters" "XXXX:YYYY"	9	**← Parameter Load Block**			Terminal transmits first block of new parameter file.
		9	**← Parameter Load Block**			Terminal transmits next block of new parameter file.
		9	**← …**			Terminal keeps sending blocks from parameter file
	"Loading Complete"	9	**← Parameter Load Block**			Terminal transmits final Parameter Load Block message to indicate end of parameter file.
		9	**Parameter Load Confirmation →**			PIN Pad sends Parameter Load Confirmation message to terminal to indicate successful load.
		0	**Online Response →**			PIN Pad has same levels of program and parameters as terminal specified. PIN Pad sends Online Response to terminal
	"Slide Card"	1				PIN Pad changes to Online state

INTERFACE

Parameters

All transaction processing sequences, screen contents, allowed transaction types and other are determined by parameters. Previously, EFT parameters were specified in the *parameter initialization file*. This parameter initialization file was plain-text file with strictly defined syntax (detailed description of EFTP6000.INI parameter file is out of scope of this document).
IBM EFT v1.0.0 introduces new format of parameter file. This is XML format file named “eft.cfg”, which contains all the information previously defined in INI file (refer to Appendix C for the sample parameter file contents).

Parameters Processing

EFT parameters processing procedure can be divided into 5 steps listed in Table 1. It is Symbol responsibility to provide EFT parameters to customers.

Table 1 Parameter processing steps

Step Number	Step description	Required software
1	Create or edit parameters initialization file.	Hypercom Parameters Builder or any text editor.
2	Create parameters XML file.	Hypercom Parameters Builder.
3	Prepare ZIP archive file.	It is recommended to use WinZip compressing tool for creation of ZIP archive file having EFT parameters.
4	ZIP archive file upload onto PIN Pad.	PIN Pad and ECR applications.

Parameter initialization file may be prepared by any text editor (e.g. Notepad). Next it has to be processed by Hypercom Parameters Builder utility.
Hypercom Parameters Builder accepts an initialization file as input and produces an XML format parameter configuration file named “eft.cfg” as output.
“eft.cfg” parameter file is then compressed into .zip archive file (no path), which can then be loaded into the Symbol PIN Pad. This zip file should be named like “EFTP001.zip”, where "EFTP" - prefix, "001" and "002" - version of the parameters (previously released version of the parameters +1).
E.g.:
"EFTP001.zip", "EFTP002.zip"...

Dynamic Parameters Update

There is a possibility to update a number of parameters dynamically, without downloading new parameters file. It can be done using Set Variable (028.) message.

For the “Terminal” statement this method allows updating following clauses:

CashbackMethod,
PINEncryptionMethod,
StartSequence.

All parameters, updated dynamically remain effective until PIN Pad reboot or new Set Variable message with this parameter is processed.

"Terminal" statement update

To update any parameter of the "Terminal" statement, Set Variable (028.) message with Variable Id = "000801", and Variable data containing clause Id followed by equal sign and new parameter value.
For example: PINEncryptionMethod=DUKPT.

✓ ***NOTE:*** One Set Variable (028.) message may contain only one new parameter value.

PIN Pad to Terminal Communications

DTR Monitoring

If the PIN Pad detects the loss of the DTR signal on the connection to the terminal, it will enter the Offline state.

Retries, Errors, Error Recovery

All messages sent between the terminal and the PIN Pad will be retried a maximum of three times (for a total of four attempts at the transmission). If a message is sent by the PIN Pad and a positive acknowledgement is not received during one of these attempts, the communications port will be closed, the PIN Pad will display an error message, and the PIN Pad will change to the Offline state.
When the PIN Pad is in the Offline state, it will monitor the RS-232 or RS-485 connection to the terminal. If the communications port is closed, the PIN Pad will periodically attempt to reopen it. Once the port is successfully reopened, the PIN Pad will wait for any messages to arrive, responding as appropriate.

STX, ETX, and LRC

Each message sent or received by either the PIN Pad or the terminal must be formatted with a leading STX (0x02) character, and followed by a trailing ETX (0x03) character and an LRC. The LRC is a checksum character generated by performing an exclusive-or operation upon all bytes of the message, excluding the STX, but including the ETX. When a message is received, the LRC calculation will be performed, and the result compared to the value of the LRC character received as part of the message. If the values are not identical, the message will be considered corrupt, and will be NAKed.

ACK and NAK

All messages received by either the PIN Pad or the terminal will be checked for format (as discussed above) and a single ACK (0x06) or NAK (0x15) character will be sent in response. The sender of the message must wait for a period of time (the parameter value for 'link level timeout') for the ACK or NAK to arrive. If an ACK is received, the message will be considered successful. If a NAK is received, or if the timeout is reached without a response, the message will be considered to have failed, and will be resent (provided the previous attempt was not the third retry attempt).

APPLICATION AND PARAMETERS DOWNLOAD ONTO PIN PAD

Types of Downloads

The application supports three types of file download:

Program download;
Parameters download;
Screens download.

All these downloads are initiated by PIN Pad if “On Line” (01.) request has application, and/or parameters, and/or screen set version numbers different from previously loaded.

✓ ***NOTE:*** It is recommended to use WinZip compressing tool for creation of ZIP archives (having program/parameters/screens) to be uploaded onto the PIN Pad.

Program and Parameters Load Version Numbers

Program load version number is a four-digit number TXYY, where: T = Terminal type, X = Major version, and YY = Minor version.

Table 2 Terminal Type Codes

PD8700	‘7’	0x37
PD4700	‘A’	0x41
PD4750	‘B’	0x42

For example: 7259 means that Terminal type = 7 (PD8700), Major version = 2, and Minor version = 59.

Sets of screens have one-digit version numbers 1 - 9.

Parameters have three-digit version numbers 001 - 999.

Application Program Download

If OnLine request (01.) has Program Load Version Number bigger than previously loaded, PIN Pad will send Program Load request (02.) to initiate new application program download.
If OnLine request's (01.) Program Load Version Number equals 0000, or it has wrong terminal type, or version number is equal or less than previously loaded, PIN Pad does not acquire program load and continues execution of the request – checks parameters and screens version numbers.
After Program Load request (02.) is sent to terminal, PIN Pad is ready to accept series of "Parameter Load Blocks" (9xx) containing portions of application program file from the terminal.

File with application program must have ZIP archive format for download purposes.
During download process it will be split into fragments. Each fragment may be not more than 720 bytes long. All fragments are transferred from the terminal to the PIN Pad sequentially by series of Parameter Load Block (9xx) messages. For transfer purposes each data fragment has to be UUencoded.

When the last block of data is received by PIN Pad it sends Parameter Load Confirmation Message (59.) to the terminal, and then decodes, merges, and unzips received application program. If application program download is completed successfully, program load version number will be updated, and PIN Pad reboots. After reboot PIN Pad remains off line.

✓ ***NOTE:*** File with application program does not contain Program Load Version Number. PIN Pad will take it from the OnLine request (01.) and store.

Screens Download

PIN Pad initiates screens download when receiving OnLine request (01.) with non-zero screens version number different from previously loaded. It responds with "Parameter Load Request" (59.) and preparing to accept series of "Parameter Load Blocks" (9xx) containing portions of zipped screens from the terminal.

Screen data contains "Form Builder" output files:

- **.img** files (each file contains bitmap image used on the screens);
- **.hfont** files (custom fonts used on the screens);
- **.scb** file (one for whole the project, which contains all screens).

All these files have to be processed by ZIP archiving utility and merged into one ZIP archive file.

During download process ZIP file will be split into fragments. Each fragment may be not more than 720 bytes long. All fragments are transferred from the terminal to the PIN Pad sequentially by series of Parameter Load Block (9xx) messages. For transfer purposes each data fragment has to be uuencoded.

When the last block of data is received by PIN Pad it sends Parameter Load Confirmation Message (59.) to the terminal, and then decodes, merges, and unzips received data. Previously loaded files with the same names will be replaced by new ones. If screen data download is completed successfully, screens version number will be updated, and PIN Pad reboots. After reboot PIN Pad remains off line.

✓ ***NOTE:*** PIN Pad takes screens version number from the OnLine request (01.) and then stores it for further use.

Parameters Download

PIN Pad initiates parameters download when receiving OnLine request (01.) with non-zero parameters version number different from previously loaded. It responds with “Parameter Load Request” (59.) and preparing to accept series of “Parameter Load Blocks” (9xx) containing portions of zipped parameters configuration file from the terminal.

Parameter Builder output file **eft.cfg** for download purposes has to be processed by ZIP archiving utility. During download process ZIP file will be split into fragments. Each fragment may be not more than 720 bytes long. All fragments are transferred from the terminal to the PIN Pad sequentially by series of Parameter Load Block (9xx) messages. For transfer purposes each data fragment has to be uuencoded.

When the last block of data is received by PIN Pad it sends Parameter Load Confirmation Message (59.) to the terminal, and then decodes, merges, and unzips received data. If parameters download is completed successfully, parameters version number will be updated, and PIN Pad will go online and send OnLine response (01.) to the terminal.

✓ ***NOTE:*** PIN Pad takes parameters version number from the OnLine request (01.) and then stores it for further use.

Appendix A **Symbol SDK Requirements**

Physical Connection

The PIN Pad may be connected to the IBM 46xx terminal via a "Feature-C" RS-232 connection. This connection is described in the IBM document "Attachment of Non-IBM I/O Devices to the 4683 Terminal". Regardless of the method used to physically connect the devices, the message protocol and message contents will remain identical to those described in the IBM document "IBM 4683 POS Terminal - Non-IBM EFT Device Attachment Information".
Additionally, IBM EFT v1.0.010 supports Symbol PIN Pad connection to the ECR via TCP/IP or USB connection.

Configuration

The following options must be configurable through a "Setup Menu", or equivalent, that can be accessed through the PIN Pad keypad or touch screen.

For all IBM 4683 connection methods	
Select IBM 4683 communications support	ON or OFF
Select IBM 4683 connection type	RS-232 or RS-485 (IBM tailgate)
If RS-232 connection is selected	
Select port speed	One of 110, 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600
Select parity	One of None, Even, Odd
Select data bits	One of 7, 8
Select stop bits	One of 1, 2
If TCP/IP connection is selected	
Specify IP address	ECR IP address
Port	Communication port
If USB connection is selected	
Specify connection to ECR USB mode. No extra configuration on the PIN Pad side is required.	

Appendix B **Notable EFT Behaviors**

This section describes some noteworthy behavior and operation of Supermarket and the EFT Feature.

Customer entered amount is re-sent by terminal when limits are exceeded.

When a customer changes the transaction amount at the PIN Pad, the PIN Pad includes the altered amount within the Authorization Request Message sent to the terminal. The terminal detects the change that has been made to the amount, and informs the operator with an "Amount Altered by Customer" message (and possibly one or more override prompts or limit messages, etc.). If the exception is not overridden by the operator or manager, the terminal will retransmit an Amount Message to the PIN Pad. This provides an opportunity for the customer to revise the amount to an acceptable value. The amount that is sent to the PIN Pad in this second Amount Message is not the original amount of the transaction. It is the customer entered amount that exceeded the terminal limits. This is possibly a defect in the EFT Feature software.

Example:
Terminal transmits Amount Message to PIN Pad with $10.00 as amount
Customer prompted "IS AMOUNT OK? $10.00"
Customer changes amount to $50.00 (original $10.00 plus $40.00 cashback)
PIN Pad transmits Authorization Request with amount of $50.00 to terminal
Terminal detects change to amount value and checks its limits for the tender
Terminal rejects the amount as exceeding a limit configured for the tender (i.e. tender does not allow cashback)
Terminal transmits a second Amount Message to PIN Pad with $50.00 as amount
Customer prompted "IS AMOUNT OK? $50.00"
… (this can repeat until the customer changes the amount to a value that is accepted by the terminal)

Transaction Sequence Number is not synchronized between Authorization Requests generated at the PIN Pad and those generated at the terminal.

The terminal is aware of the last sequence number used by the PIN Pad, but the PIN Pad is not aware of the last sequence number used by the terminal. This can result in authorization requests going to the host with duplicate sequence numbers.

Here is an example: VISA tender goes through the PIN Pad, cheque tender does not.

Enter a VISA tender. Sequence number sent to host is 1.
Enter another VISA tender. Sequence number is 2.
Enter a cheque. Sequence number is 3.
Enter a VISA tender. Sequence number is 3. This is a duplicate sequence number.

Display Message in Authorization Response loses last character.

The EFT application does not correctly extract the display message field from the host response. The code correctly determines the beginning of this field. To correctly extract the display message field, the application should have gone to the next field separator. However, instead, it goes to the end of the host message, minus two. (ETX's have already been stripped off at this point).

It can only be assumed that the code is expecting the last two characters to be the field separator that follows the display message, and a blank in the amount field that is used for cash all or balance inquiry amount.

Accordingly, the code was tested with host responses that forced the amount field to always contain something, either cash all amount or a balance inquiry amount or a blank. This corrected the problem of the last character getting dropped from the response display string returned from the host.

However, there is still a problem here that the PIN Pad application must be aware of. If a cash all amount is returned in the amount field, part of the amount will be passed to the PIN Pad in the display message string.

If the host message looks like this: `A P P R O V A L <FS> < 1 0 0 0 <`

Then the EFT application will mistakenly pass the display message field to the PIN Pad as follows: `A P P R O V A L <FS> < 1 0 0`

As described above, the last two characters are dropped. Other PIN Pad applications seem to handle this without great difficulty. They apparently terminate the display message field at the field separator <FS>, thus correctly displaying "APPROVAL".

Account Type indicator is stored in PIN Block

The EFT Feature requires the Account Type indication to be placed within the PIN Block data field of the Authorization Request Message, as shown by the “f” character in the following PIN Block description.

PIN Information – 2 characters (always "1@" if no PIN is used), or 23 characters "1J…" conforming to 23 character static key encryption, if PIN is used for the selected tender.

The 23 character static key data is formatted as follows: "1Jfxxyyaaaaaaaaaaaaaaa"

"1J" = fixed text indicating presence of PIN data within this field

“f” = a single character that Supermarket EFT Feature uses to indicate the Account Type ('0' = Checking, '1' = Savings).

“xx” = Maximum PIN Length, a two digit value ("04" - "12", inclusive) that indicates the maximum length PIN that the PIN Pad can generate.

“yy” = PIN Block Format, a two digit code ("01" - "04", inclusive) that indicates the encryption method used to create the PIN Block. ("01" is expected)

“aaaaaaaaaaaaaaaa” = PIN Block Data, 64 bits of encrypted PIN Data, expanded to a 16 character hexdump string.

The implication of this is that the Account Type Selection option used within the PIN Pad parameters cannot be set to Yes without also setting the PIN Required option to Yes.

State values returned in Status Response Message do not cover all actual PIN Pad states

The Status Response Message defined in the IBM EFT specifications document, and used by the EFT Feature software, does not list enough State values to cover all actual PIN Pad states that are required by the running PIN Pad application.

This is most noticeable in the lack of a “Please Wait” state value. Also missing are values for “Account Type” and “Enter New Amount” states.

The Status Response Message will therefore not contain state values that truly reflect the internal state of the PIN Pad application. The display message fields used within the Status Response Message will be accurate, however. The state values returned to the EFT Feature software at the terminal will be:

PIN Pad state	Status Response state value
Please Wait	02 (Transaction Type)
Account Type	02 (Transaction Type)
Enter New Amount	04 (Amount OK)

Terminal Serial Number field in Auth. Requests may be incorrect

The Terminal Serial Number field within an Authorization Request sent to the Host by the EFT Feature software may be incorrect in certain situations when the PIN Pad is not used in the transaction (e.g. Check Authorizations). These situations include:

When the PIN Pad has been changed (or the configured Terminal Number has been changed). The terminal (IBM 46xx) stores the value of the most recently received Terminal Serial Number sent by the PIN Pad; after the PIN Pad change, the terminal will not receive and store the new Terminal Serial Number until after a transaction that uses the PIN Pad. Any non-PIN Pad EFT transactions (e.g. Check Authorizations) will use the Terminal Serial Number of the old PIN Pad.

When the terminal (IBM 46xx) is initially loaded, it contains no value for the most recently received Terminal Serial Number sent by the PIN Pad. Any non-PIN Pad EFT transactions (e.g. Check Authorizations) will use a zero value for the Terminal Serial Number.

Appendix C **Sample Parameter File**

eft.cfg file contents:

```
<EFTParameters>
	<Communication ErrorRetries="0" LinkLevelTimeout="3" ReInitDelay="3" />
	<Terminal BankID="123456" CashbackMethod="2" CategoryCode="0001" CountryCode="840"
ErrorDisplayTimeout="3" FirstStateIsSlideCard="1" MerchantNumber="000000003456" PINEncryptMethod="2"
StoreNumber="0001" TerminalNumber="0003" TimeZone="704" UsesSelectLanguage="0"
UsesSignatureCaptureState="1" WorkingKey="DD7515F2BFC17F85" ZIPCode="92122" />
	<Display>
		<DisplayState ID="1">
			<TopLine Lang1="This&#x20;lane&#x20;is&#x20;closed&#x2E;"
Lang2="Cette&#x20;lane&#x20;est&#x20;ferme" />
			<BottomLine Lang1="Please use next lane." Lang2="utilise&#x20;la&#x20;prochaine" />
			<Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
		</DisplayState>
		<DisplayState ID="3">
			<TopLine Lang1="Please&#x20;select" Lang2="Choisir&#x20;La&#x20;Methode" />
			<BottomLine Lang1="payment&#x20;type" Lang2="Pour&#x20;Payer" />
			<Button FunctionCode="21" Index="1" Lang1="DEBIT" Lang2="DEBITE" />
			<Button FunctionCode="20" Index="2" Lang1="CREDIT" Lang2="CREDITE" />
			<Button FunctionCode="50" Index="3" Lang1="EBT" Lang2="TBE" />
			<Button FunctionCode="24" Index="4" Lang1="ACH" Lang2="ECHEQUE" />
			<Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
			<Button FunctionCode="1" Index="6" Lang1="CANCEL" Lang2="CANCELER" />
		</DisplayState>
		<DisplayState ID="2">
			<TopLine Lang1="Please&#x20;slide" Lang2="Glisser&#x20;La&#x20;Carte" />
			<BottomLine Lang1="your&#x20;card" Lang2="Magnetique&#x2C;&#x20;SVP" />
			<Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
		</DisplayState>
		<DisplayState ID="14">
			<TopLine Lang1="Please&#x20;select" Lang2="Choisir&#x20;Le" />
			<BottomLine Lang1="account&#x20;type" Lang2="Account" />
			<Button FunctionCode="5" Index="1" Lang1="CHECKING" Lang2="ECHEQUE" />
			<Button FunctionCode="6" Index="2" Lang1="SAVINGS" Lang2="EPARGNE" />
			<Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
			<Button FunctionCode="1" Index="6" Lang1="CANCEL" Lang2="CANCELER" />
		</DisplayState>
		<DisplayState ID="4">
			<TopLine Lang1="Enter&#x20;PIN" Lang2="Entrez&#x20;Votre&#x20;PIN" />
			<BottomLine Lang1="and&#x20;press&#x20;ENTER" Lang2="Et&#x20;Appuyer&#x20;OK" />
			<Button FunctionCode="2" Index="1" Lang1="ENTER" Lang2="OK" />
			<Button FunctionCode="3" Index="2" Lang1="Clear" Lang2="EFFACER" />
			<Button FunctionCode="1" Index="3" Lang1="Cancel" Lang2="CANCELER" />
			<Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
			<Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
		</DisplayState>
		<DisplayState ID="5">
			<TopLine Lang1="Is&#x20;amount&#x20;OK&#x3F;" Lang2="Montant&#x20;Est&#x20;OK&#x3F;"
/>
			<BottomLine Lang1="" Lang2="" />
			<Button FunctionCode="2" Index="1" Lang1="YES" Lang2="OUI" />
```

```
                        <Button FunctionCode="4" Index="2" Lang1="NO" Lang2="NO" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="1" Index="6" Lang1="Cancel" Lang2="CANCELER" />
                </DisplayState>
                <DisplayState ID="12">
                        <TopLine Lang1="Is&#x20;refund&#x20;OK&#x3F;" Lang2="Rabais&#x20;Est&#x20;OK&#x3F;"
/>
                        <BottomLine Lang1="" Lang2="" />
                        <Button FunctionCode="2" Index="1" Lang1="YES" Lang2="OUI" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="1" Index="6" Lang1="CANCEL" Lang2="CANCELER" />
                </DisplayState>
                <DisplayState ID="6">
                        <TopLine Lang1="Processing" Lang2="En&#x20;Progres" />
                        <BottomLine Lang1="please&#x20;wait&#x2E;&#x2E;&#x2E;"
Lang2="Attendre&#x2C;&#x20;SVP&#x2E;&#x2E;&#x2E;" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
                </DisplayState>
                <DisplayState ID="7">
                        <TopLine Lang1="" Lang2="" />
                        <BottomLine Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
                </DisplayState>
                <DisplayState ID="8">
                        <TopLine Lang1="Re&#x2D;Enter&#x20;PIN" Lang2="Encore&#x20;Votre&#x20;PIN" />
                        <BottomLine Lang1="and&#x20;press&#x20;ENTER" Lang2="Et&#x20;Appuyer&#x20;OK" />
                        <Button FunctionCode="2" Index="1" Lang1="ENTER" Lang2="OK" />
                        <Button FunctionCode="3" Index="2" Lang1="CLEAR" Lang2="EFFACERR" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="1" Index="6" Lang1="CANCEL" Lang2="CANCELER" />
                </DisplayState>
                <DisplayState ID="9">
                        <TopLine Lang1="Parameter&#x20;load" Lang2="Les&#x20;Params&#x2E;&#x20;Sont" />
                        <BottomLine Lang1="requested&#x2E;&#x2E;&#x2E;" Lang2="Requisees&#x2E;&#x2E;&#x2E;"
/>
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
                </DisplayState>
                <DisplayState ID="10">
                        <TopLine Lang1="Loading&#x20;parameters" Lang2="Prendre&#x20;Les&#x20;Params&#x2E;"
/>
                        <BottomLine Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
```

```
                </DisplayState>
                <DisplayState ID="11">
                        <TopLine Lang1="Please&#x20;wait" Lang2="Attendez&#x20;Pour" />
                        <BottomLine Lang1="for&#x20;the&#x20;cashier&#x2E;&#x2E;&#x2E;"
Lang2="L&#x27;Operateur&#x2C;&#x20;SVP" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="1" Index="6" Lang1="CANCEL" Lang2="CANCELER" />
                </DisplayState>
                <DisplayState ID="15">
                        <TopLine Lang1="Error" Lang2="Erreur&#x20;En" />
                        <BottomLine Lang1="reading&#x20;card" Lang2="Lisant&#x20;La&#x20;Carte" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
                </DisplayState>
                <DisplayState ID="16">
                        <TopLine Lang1="Transaction" Lang2="Transaction" />
                        <BottomLine Lang1="cancelled" Lang2="CANCELER" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
                </DisplayState>
                <DisplayState ID="19">
                        <TopLine Lang1="Error&#x2C;&#x20;over" Lang2="Erreur&#x2C;&#x20;En&#x20;Dessus" />
                        <BottomLine Lang1="cashback&#x20;limit" Lang2="Du&#x20;Limite&#x20;D&#x27;Argent" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
                </DisplayState>
                <DisplayState ID="20">
                        <TopLine Lang1="Do&#x20;you&#x20;want"
Lang2="Est&#x2D;ce&#x20;que&#x20;tu&#x20;veux" />
                        <BottomLine Lang1="cashback&#x3F;" Lang2="De&#x20;L&#x27;Argent&#x3F;" />
                        <Button FunctionCode="2" Index="1" Lang1="YES" Lang2="OUI" />
                        <Button FunctionCode="3" Index="2" Lang1="NO" Lang2="NON" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="1" Index="6" Lang1="CANCEL" Lang2="CANCELER" />
                </DisplayState>
                <DisplayState ID="21">
                        <TopLine Lang1="Select" Lang2="Choisir" />
                        <BottomLine Lang1="cashback&#x20;amount" Lang2="Montant&#x20;De&#x20;L&#x27;Argent"
/>
                        <Button FunctionCode="9" Index="1" Lang1="&#x24;20" Lang2="&#x24;20" />
                        <Button FunctionCode="9" Index="2" Lang1="&#x24;40" Lang2="&#x24;40" />
                        <Button FunctionCode="9" Index="3" Lang1="&#x24;60" Lang2="&#x24;60" />
                        <Button FunctionCode="9" Index="4" Lang1="&#x24;80" Lang2="&#x24;80" />
                        <Button FunctionCode="9" Index="5" Lang1="&#x24;100" Lang2="&#x24;100" />
                        <Button FunctionCode="9" Index="6" Lang1="NONE" Lang2="NONE" />
                </DisplayState>
                <DisplayState ID="50">
                        <TopLine Lang1="Select&#x20;EBT" Lang2="Choisir&#x20;La&#x20;Methode" />
                        <BottomLine Lang1="payment&#x20;type" Lang2="Pour&#x20;Payer&#x20;Avec&#x20;TBE" />
```

```
                        <Button FunctionCode="23" Index="1" Lang1="FOODSTAMPS" Lang2="TIMBRES" />
                        <Button FunctionCode="22" Index="2" Lang1="CASH" Lang2="CASH" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="4" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="5" Lang1="" Lang2="" />
                        <Button FunctionCode="1" Index="6" Lang1="CANCEL" Lang2="CANCELER" />
                </DisplayState>
                <DisplayState ID="18">
                        <TopLine Lang1="Please&#x20;sign" Lang2="Signee&#x20;SVP" />
                        <BottomLine Lang1="in&#x20;the&#x20;box&#x2E;&#x2E;&#x2E;"
Lang2="dans&#x20;la&#x20;boite&#x2E;&#x2E;&#x2E;" />
                        <Button FunctionCode="0" Index="1" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="2" Lang1="" Lang2="" />
                        <Button FunctionCode="0" Index="3" Lang1="" Lang2="" />
                        <Button FunctionCode="2" Index="4" Lang1="OK" Lang2="OK" />
                        <Button FunctionCode="3" Index="5" Lang1="CLEAR" Lang2="EFFACER" />
                        <Button FunctionCode="0" Index="6" Lang1="" Lang2="" />
                </DisplayState>
                <CashbackAmount Amount="2000" />
                <CashbackAmount Amount="4000" />
                <CashbackAmount Amount="6000" />
                <CashbackAmount Amount="8000" />
                <CashbackAmount Amount="10000" />
                <CashbackAmount Amount="0" />
        </Display>
        <PaymentTable>
                <PaymentType AccountChecksumCheck="1" AccountLengthCheck="1" AccountTypeSelect="0"
AmountConfirmation="0" BINRangeComparison="0" CashBackAllowed="0" CashBackLimit="0" ExpiryDateCheck="0"
ID="20" Name="CR" PINRequired="0" PurchaseCode="21" RefundCode="22">
                        <AccountLength Length="12" />
                        <AccountLength Length="13" />
                        <AccountLength Length="14" />
                        <AccountLength Length="15" />
                        <AccountLength Length="16" />
                        <AccountLength Length="17" />
                        <AccountLength Length="18" />
                        <AccountLength Length="19" />
                </PaymentType>
                <PaymentType AccountChecksumCheck="1" AccountLengthCheck="0" AccountTypeSelect="14"
AmountConfirmation="1" BINRangeComparison="0" CashBackAllowed="1" CashBackLimit="10000"
ExpiryDateCheck="0" ID="21" Name="DB" PINRequired="1" PurchaseCode="30" RefundCode="31" />
                <PaymentType AccountChecksumCheck="0" AccountLengthCheck="0" AccountTypeSelect="0"
AmountConfirmation="1" BINRangeComparison="0" CashBackAllowed="0" CashBackLimit="0" ExpiryDateCheck="0"
ID="22" Name="EB" PINRequired="1" PurchaseCode="61" RefundCode="62" />
                <PaymentType AccountChecksumCheck="0" AccountLengthCheck="0" AccountTypeSelect="0"
AmountConfirmation="1" BINRangeComparison="0" CashBackAllowed="1" CashBackLimit="5000" ExpiryDateCheck="0"
ID="23" Name="AF" PINRequired="1" PurchaseCode="51" RefundCode="52" />
                <PaymentType AccountChecksumCheck="0" AccountLengthCheck="0" AccountTypeSelect="0"
AmountConfirmation="1" BINRangeComparison="0" CashBackAllowed="0" CashBackLimit="0" ExpiryDateCheck="0"
ID="24" Name="AC" PINRequired="0" PurchaseCode="71" RefundCode="72" />
                <CreditCard AccountChecksumCheck="0" AccountLengthCheck="0" AccountTypeSelect="0"
AmountConfirmation="1" BINRangeComparison="1" CashBackAllowed="1" CashBackLimit="10000"
ExpiryDateCheck="0" ID="20" Name="VI" PINRequired="0" PurchaseCode="20" RefundCode="21">
                        <BINTable>
                                <BINs BINHigh="49" BINLow="00" />
                                <BINs BINHigh="99" BINLow="50" />
                        </BINTable>
                </CreditCard>
                <CreditCard AccountChecksumCheck="1" AccountLengthCheck="0" AccountTypeSelect="0"
AmountConfirmation="1" BINRangeComparison="1" CashBackAllowed="1" CashBackLimit="10000"
ExpiryDateCheck="0" ID="20" Name="MC" PINRequired="1" PurchaseCode="20" RefundCode="21">
                        <BINTable>
                                <BINs BINHigh="49" BINLow="00" />
                                <BINs BINHigh="99" BINLow="50" />
                        </BINTable>
                </CreditCard>
        </PaymentTable>
</EFTParameters>
```

GLOSSARY

ACE

The IBM SurePOS ACE application, operating within the IBM cash register terminal and the IBM 4690 store controller.

ACH

Automated Clearing House

Application

The program code described by this document, designed to execute within the Symbol PD87xx device

Controller

A computer that is running the IBM 4690 Operating System, and is loaded with the IBM 4690 Supermarket Application. The computer, O/S, and Supermarket Application components are collectively referred to as the "Controller".

Customer

The customer of the store; the user of the Symbol PIN Pad device.

EBT

Electronic Benefits Transfer

EFT Feature

An add-on enhancement to the basic EFT support within Supermarket. This term is used to indicate the IBM 4680-90 Enhanced Electronic Funds Transfer (EFT) Feature software.

EPS

The IBM SurePOS ACE EPS Feature, operating together with the ACE application on the store controller and cash register terminal.

FastLoad

The Hypercom FastLoad protocol, used to download a program image file into an Symbol PIN Pad.

Host

The system at the bank, credit card company, financial institution, or government that receives the Authorization Requests generated by the Symbol PIN Pad/terminal/controller system and approves or declines their use.

MINC

Magnetic Ink Character Recognition

Operator

The cashier or store clerk operating the IBM 46xx terminal

PIN Pad

Symbol PIN Pad device

Supermarket

The IBM 4690 Supermarket Application; the program code operating within the IBM cash register terminal and the IBM 4690 store controller

Terminal

The IBM 4683 (or 4684, 4693, 4694) cash register terminal

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Symbol Technologies, Inc.
One Symbol Plaza
Holtsville, New York 11742-1300
http://www.symbol.com

72E-91526-01
Revision A - November 2006